# MODERN PLASTICS



NOVEMBER 1948

CR product engineers and designers, the unsurpassed versatility and dependable uniformity of Durez phenolic plastics offer a vast storehouse of solutions to design, structural, and production problems. An example of versatility is in impact strength. This is available in Durez compounds in a wide range to fit many applications. Emphasis on strength is obtained through manipulation in structure without undue sacrifice of heat resistance, self-insulation, surface luster, and other wanted properties.

The molded parts shown here suggest the many industrial services that impact strength Durez is performing. Your products may or may not require the highest degree of strength for long-life expectancy, Yet it is well to know that real ruggedness can be had with the simplicity and speed of molding.

"Durez Plastics News" can keep you advised each month of what other manufacturers are accomplishing with Durez. Let us send it to you.

USE DUREZ Durez Plastics & Chemicals, Inc., 1211 Walck Road, North Tonawanda, N. Y. FOR RUGGED

Export Agents: Omni Products Corp., 460 SERVICE AND Fourth Avenue, New York 16, N. Y.

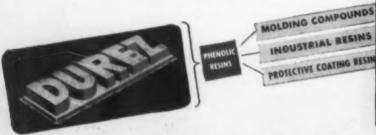
# Long-Life Expectancy"

TEXTILE MACHINE tension pulley is a molded shell of mediumimpact Durez, fitted with metal shields and mounted on a deep-groove metal ball bearing. Non-corrosiveness, light weight, and moldability are desirable properties that supplement the impact resistance of Durez in textile machinery.

TIRE INSPECTOR locating head serves to spot bits of metal imbedded in rubber. Self-insulation in the material is the primary requisite. Impact-resistant Durez combines this with strength needed to withstand rough service in garages.

MAGNETO PARTS requiring metal inserts are best made of a plastic material with a flexible set that will not crack around the inserts, Measuring high in all needed properties, one of the high-impact Durez compounds is widely used in this service.

IRONER FORMING TABLE of Durez emerges from die with moldedin finish over which damp clothes will slide easily and smoothly. Impact strength of this plastic enables the table to take hard wash-day abuse. Easy moldability and dielectric properties are duplicated in the Durez thermostat dial knobs, shaft, and brackets.



PHENOLIC PLASTICS that fit the job



the

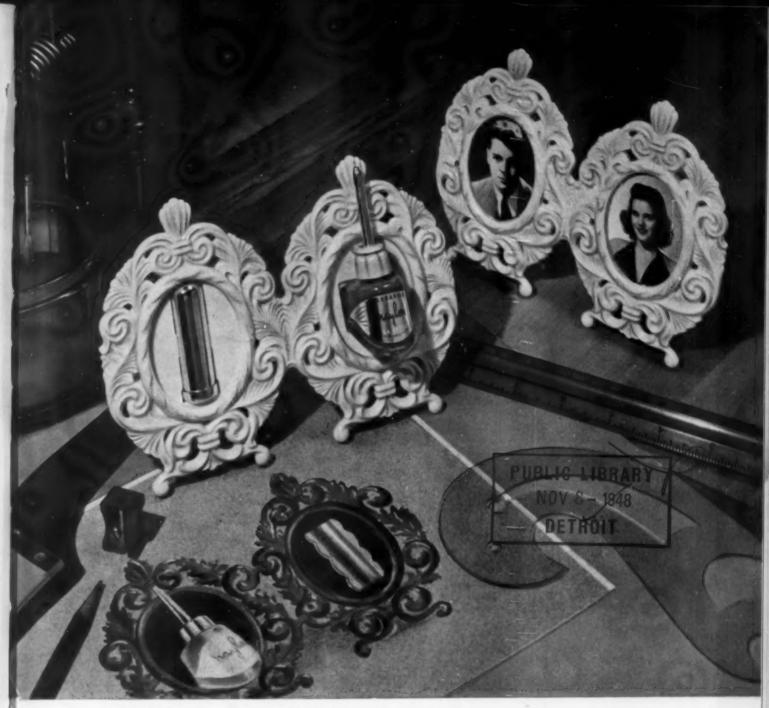
ini

03

yie

a fi pro

vis Sta the



### TECHNOLOGY DEPARTMENT

# An Ounce of Catalin Styrene "Packs A Pound of Punch"...for Pennies!

If your plastic-projected idea looks good on paper . . . and you are ready to go ahead — check the material advantages of *Catalin Styrene!* As the lightest weight plastic, *Catalin Styrene* is also the thriftiest. It costs little, and *that* little goes a long way. By delivering more injection-molded pieces per pound, it stretches the sponsor's dollar . . . adds to the product's purchase appeal . . . yields a greater sales return.

For example, TWINTYPE, above . . . a framework for increased product sales progresses an idea as the designer first visualized it, and as the molder, using Standard Catalin Styrene, carried through the specifications. However for those oc-

casional purposes where boiling waterresistance is a prime requirement, Catalin can supply (and has supplied for a long time) a superior low-cost heat resistant Styrene that completely satisfies the specifications.

When planning your next product or package, Catalin's experienced technical staff shall be glad for a before-hand opportunity to discuss "our family" of plastics with you, and to suggest the proper material, and processing method. Inquiries invited!

Credits: Twintype Frames, created by Design Associates Ltd. for La Cross; custom molded by Sterling Plastics Co., Union, N. J. Pencil sharpener and ruler, shown in picture, also molded of Catalin Styrene, are proprietary items of Sterling Plastics Co.



Sixteen pages of illustrations, applications, information, physical properties, etc. . . . a valuable compilation for designers and manufacturers. Your letterhead request brings your copy by return mail.

CATALIN CORPORATION OF AMERICA
ONE PARK AVENUE . NEW YORK 16, N. Y.



# MODERN PLASTICS

**VOLUME 26** 

GENERAL

NOVEMBER 1948

NUMBER 3

### CONTENTS

### Who is to Blame for Fires? (Editorial) ..... Selling With Plastics Displays ...... 75 New retail outlets being built, and old ones being refurbished, are using more and more sales aids based on plastics Award of Competition Trophies ..... An account of the formal presentation to award winners in Seventh MODERN PLASTICS Competition Meet the Editorial Staff .......84 Introducing Hiram McCann as the new Editor . . . and the rest of the staff Seen at the N. P. E. .... Recent developments and important trends as viewed at the recent Exposition Decorative coffee tables built from salvaged acrylic domes Disposable Nursing Bottles ..... Polyethylene tubing and melamine locking rings make a vast improvement in baby's nursing bottle Annual S. P. E. Technical Conference ..... Details of the program to be presented next January, and of the papers to be read Models Demonstrate Hudson Car Features ...... 94 Miniatures, precisely scaled down from the full size car, graphically show main engineering features Stitchless Quilted Vinyl ..... Used for upholstery and wall covering, new material is heat sealed in quilted pattern Plastics Products .... New applications of plastics in a wide range of fields S. P. I. Remobilization Program Meeting ........... 156 Government representatives tell what they want from the plastics industry Contour-Formed Chairs ...... 154 Bottle-Cap Door Ad ...... 166 Flexible Butyrate Nameplate ...... 168 Jar-Top Coaster ...... 170

Laminate in Traffic Signs ...... 172

### PLASTICS ENGINEERING

Plastics in Refrigerators	105
Injection Molded Large Partsby J. R. Finn and Harry C. Haaxma	103
Plastics and the Crosley Refrigerator Design by Al Nave	106
Polystyrene in Centrifugal Casting	112
Phenolic Improves Jet Pump	116
TECHNICAL	
Thermal Effects on Flexural Strength of Laminates  by Patrick Norelli	121
Manufacture and Use of Polyethylenimine in Germany	130
DEPARTMENTS	
Plastics Digest	134
U. S. Plastics Patents	140
New Machinery and Equipment	146
Books and Booklets	148
Plastics Stock Molds	152

PUBLICATION OFFICE: Orange, Conn. Executive and Editorial Office: 122 E. 42nd St., New York 17, N. Y. Published each month by Modern Plastics, Inc. Entered as second class matter, at the Post Office at Orange, Conn., under the act of March 3, 1879. Copyright 1948 by Modern Plastics, Inc. All rights reserved. Subscription \$5.00 a year, \$8.00 for two years in the U. S., its possessions and South America. Canadian subscriptions \$5.50 a year, \$9.00 for two years. All other countries \$6.00 a year, \$10.00 for two years, payable in U. S. currency. Price of this issue 75¢ per copy. \*Reg. U. S. Patent Office.

News of the Industry; Predictions and Inter-pretations; Company News; Personal; Meetings

The Plastiscope .....



Wataseal Plastic Fabric by Harte & Company, In

THIS could be a "cold" kitchen, but it isn't. All those gay, colorful decorations help to warm it up—and they also demonstrate the beautifying and practical characteristics of film made from Geon polyvinyl resins.

The bright shade at the window shows how this film takes to clear, high colors. The apron, curtains and the checked tablecloth are an example of the infinite variety of prints to be obtained. Even the covers for the bowl and mixer have special advantages. For the Geon resins have been formulated in this film to be remarkably kitchen-proof. The film can be cleaned with a damp cloth, is waterproof and tough. Though soft and flexible, it resists wear.

The ideas we talk about here may give you some others—and you needn't limit yourself to kitchens. Geon can be molded, extruded, or used as an impregnant for paper or textiles.

We make no finished products from Geon-or from other B. F. Goodrich Chemical Company raw materials. However, we'll be glad to work with you on any special problems or applications. For more information, write B. F. Goodrich Chemical Company, Dept. 0-11, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.



## B. F. Goodrich Chemical Company

A DIVISION OF HE B. F. GOODRICH COMPAN

GEON polyvinyl materials . HYCAR American rubber . KRISTON thermosetting resins . GOOD-RITE chemicals



It's the new Stereo REALIST Viewer made by David White Company of Milwaukee . . . a truly fine instrument for viewing three-dimensional color transparencies. New in design . . . precision built . . . embodying many unique features . . . this impressive development adds breath-taking beauty and astounding realism to the pictures and offers

untold possibilities as an important tool for sales and sales promotion work.

The major structural elements... case, eye piece, and knobs... were molded of a black phenolic material combining rich, handsome appearance with precision, strength, and handling comfort. It's the job that won for Chicago Molded

another "first" in the 1947 Modern Plastics Awards.

Precision molding of plastics is our business...and by that we mean molding and everything that goes with it...design, engineering, mold-making, finishing. We take full and undivided responsibility. We can do this because we have the facilities...every needed size and

type of equipment... plus the experience of more than a quarter century in plastics.

These are facts worth keeping in mind for when you're ready to discuss your next plastics molding job you'll find it good business to talk with a CMPC Development Engineer. Just phone or write... there's no obligation.

CHICAGO MOLDED PRODUCTS CORPORATION

1046 N. Kolmar Ave.



Chicago 51, Illinois

Representatives in principal industrial centers

COMPRESSION and INJECTION molding of all plastic materials



### EDITORIAL

#### EDITORIAL STAFF

Publisher and Editor-in-Chief:
CHARLES A. BRESKIN
Editor: HIRAM McCANN
Technical Editor: Dr. Gordon M. Kline
Engineering Editor: Fred B. Stanley
Senior Editor: R. L. Van Boskirk
Managing Editor: A. Paul Peck
Art Director: Donald R. Ruther
Midwestern Editor: Val Wright
Associate Editor: Virginia Sue Wilson
Associate Editor: Warren H. Goodman
Assistant Editor: Theodore B. Breskin
Assistant Editor: Linda T. Lefler •
Readers Service: Emma Turak

#### BUSINESS STAFF

General Manager: ALAN S. COLE

P. H. Backstrom
M. A. Olsen
J. M. Connors
R. C. Beggs
A. M. Rothenberg
Burton W. Gussow
Joseph A. Drucker
W. F. Kennedy

Promotion Manager: PHILIP W. MULLER Production Manager: DANIEL M. BROADS Asst. Production Manager: B. J. FARINA

Executive and Editorial Offices: 122 E. 42nd St., New York 17, N. Y. Tel., MUrray Hill 3-0655

Circulation Department
Circulation Manager: Frederick A. Klein
32 Broadway, New York 4, N. Y.
Tel., Whitehall 4-4782

Branch Offices

Chicago 1: 221 N. La Salle St. Manager: J. M. Connors Tel., Financial 6-3450

Cleveland 14: 815 Superior Ave. Manager: R. C. Beggs Tel., Superior 0737

Los Angeles 5: 2412 W. 7th St. Tel., Fairfax 6255 San Francisco 5: 1085 Monadnock Bldg. Tel., Douglas 2-4475 Manager: A. M. Rothenberg

London, England: Transatlantic Publicity, Ltd., 20/21 Broad Street Ave., Bromfield St., London E.C. 2. Manager: L. H. Dolaro

MODERN PLASTICS is fully protected by copyright and nothing that appears in it may be reprinted wholly or in part, without special permission.





Member Audit Bureau of Circulation Member Associated Business Papers MODERN PLASTICS is regularly indexed in Industrial Arts Index and Industex.

### Who is to blame for fires?

Fire is always an awesome spectacle; it is no respecter of person or property—it attacks a farmer's smokehouse, a baron's castle, a million dollar factory, all with equal fury. And despite the intelligent and earnest efforts made to control this red demon, it are up more property than ever before in 1947.

The plastics and chemical industries have all too frequently been the object of considerable finger pointing as sources of fire hazards. This is unfortunate because the finger pointing is often unjust. Of course, we don't fool ourselves with the belief that certain plastics and chemicals can be handled without safeguards, but in the majority of cases proper precautions are taken. It is doubtful that any industry employs more effective safety measures than the chemical industry as a whole. It is therefore distressing to read distorted items in the press which place more than a fair share of blame on plastics or chemicals when fire strikes. Dust explosions, for example, are just as common in other industries as in plastics or chemicals.

Time after time plastics or chemicals are blamed for fires when the plants in which they are made are only incidentally involved. Admittedly, there are frequent fire hazards in plastics manufacturing but by the same token there are also hazards in steel making, starch and milling operations, petroleum processing, lumbering, and many other industries, even including agriculture.

Nevertheless, misunderstandings regarding fires in the plastics industry would not exist if there were no fires. It therefore behooves the industry to improve its housekeeping so that there will be even less likelihood of catastrophe. Thus it is encouraging to note that S.P.I. is working with the Board of Fire Prevention Regulations in Massachusetts to draw up suitable rules and regulations governing the manufacture and handling of plastics which will require companies to maintain safe standards in all processing equipment; reduce to a minimum the hazards from free dust; and provide for special care in handling nitrocellulose. While these regulations will affect only the plastics industry in Massachusetts, plastics manufacturers elsewhere can study them with benefit since other states and municipalities are also concerned. There will likely be some complaining and bickering over the regulations if they are strict enough to be worth their salt, but the industry itself will be far better off when it has made every practical provision for fire prevention and for control of fire when, despite all care, it does break out.

BIG RUNS
(large or small PARTS)

are everyday business

SILL CAP FOR RAILWAY CARS



Manufacturers of

# Molded INSUROK R.T.M.

Capacity for big runs is only one of the advantages offered in custom molding by The Richardson Company. A blend of long experience, able engineering, plant capacity and all-around production efficiency helps give you a quality job at a price that's right. Perhaps you can use these advantages to your advantage.

### The RICHARDSON COMPANY

Sales Headquarters: MELROSE PARK, ILLINOIS

INDIANAPOLIS - MILWAUKEE - NEW BRUNSWICK, (N. J.) - NEW YORK - PHILADELPHIA - ROCHESTER - ST. LOUIS



### MR. McHALE TAKES A FLYER

Molded of Du Pont nylon, his new flyer block pays off in sales

Mr. McHale makes flyer blocks... textile spinning-machine parts that keep yarn under control during twisting. But he became dissatisfied with the types in use. They required lubrication, which splattered on the yarn when the blocks whirled at speeds up to 15,000 rpm. They were complex in construction and easily broken, and they jammed when swollen by absorbed moisture.

So Mr. McHale set out to make a better flyer block. He tested many materials—metals, wood, fibre and plastics. Then he tried nylon plastic . . . and found that no other material combined so many desired properties. In fact, nylon permitted a completely new flyer block design—a compact, one-piece molded unit

with a list of advantages that were bound to build sales.

The nylon blocks are light and strong...easily cleaned with soap and water or gasoline. What's more—because of the bearing properties of nylon, they need no lubrication. And nylon brought new efficiency to Mr. McHale's manufacturing plant. Each unit is removed from the injection-molding shot as a highly polished, perfectly balanced block. It doesn't need fitting, drilling, reaming or smoothing.

Perhaps you, like Mr. McHale, may find a new path to profits with nylon or another Du Pont plastic—by improving an old product or developing a new one. Write

now for literature. E. I. du Pont de Nemours & Co. (Inc.), Plastics Dept., Room 3611, Arlington, N. J.

Nylon flyer block, injection-molded by M. J. McHale Company, Scranton, Pennsylvania.

Tune in to Du Pont
"CAVALCADE OF AMERICA,"
Monday nights-NBC coast to coast.





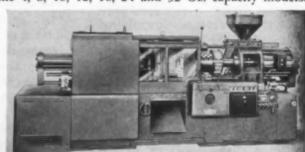
# PROFIT IN PLASTICS FROM NEW BUSINESS

Molder's ingenuity and modern machines create new markets!

The development of the all plastic chromatic harmonica and the new sensational Junior and Super accordians for children, are perfect examples of the harmonious coordination between molder, method and machine, leading to "profit in plastics" for the Magnus Harmonica Corporation of Newark, N. J.

These plastic parts requiring tolerances as close as .0001" for true tone are molded of polystyrene on Reed-Prentice injection machines. Finn H. Magnus, who has established a reputation for the ingenious design of these instruments, refers to the new toy accordian as follows: "While present models are classified as musical toys, it may well be that we are on the threshold of a new industry."

Your problem calls for the mass production of thermoplastic parts or products. Remember . . . Reed-Prentice injection machines are proven . . . are dependable on long runs because of perfect adjustment and control of the three molding variables . . . (1) time, (2) temperature and (3) pressure. Eliminate rejects . . . speed up production . . . write Dept. D for complete information on the 4, 8, 10, 12, 16, 24 and 32 Oz. capacity models.



CLEVELAND 1213 West 3rd Street Si

sel

be

ae

in th

pa

THE WORLD'S LARGEST MANUFACTURERS OF INJECTION MOLDING MACHINES

WORCESTER TO CHIME

NEW YORK 75 West Street LOS ANGELES 2314 Santa Fe Ave.



Simultaneous translation into 7 different languages makes the IBM wireless translating system embodying Filene-Finlay patents a vital part of international conferences. Worn on the chest, it picks up broadcast signals through its neck-strap antennae, and amplifies a translation of the speaker's words in the language the listener selects. Its housing is molded of Forticel—Celanese\* cellulose propionate.

of ed-

raup on

> Forticel was selected for this important application because of its ideal combination of mechanical and aesthetic qualities. This premium plastic is unmatched in impact and tensile strength, and gives the housing the toughness to withstand continuous handling by delegates, diplomats and visitors—with a generous margin to spare for accidents and abuse.

> Forticel has the form retention and low humidity expansion for close-tolerance-fitting of parts. It is light in weight and odorless for wearing comfort. Its lustrous

surface only improves with use.

Forticel's molding characteristics are excellent. They include high fidelity to detail, virtually invisible weld lines, and brilliant molded surfaces that need little or no finishing.

When you want to put the best in a product so that the user gets the most out of it . . . when you have exacting molding requirements . . . when you need a definitely superior cellulosic, Forticel is the plastic for you.

### CELANESE CORPORATION OF AMERICA

Plastics Division, Dept. D-1

180 Madison Avenue, New York 16, N. Y.

Celanese Plastic

PReg. U. S. Pat. Off.

# CINNOUNCEMENT

### WEST COAST UNIVERSITY los angeles, california

has acquired the laboratories and training facilities and has retained the staff of

# PLASTICS INDUSTRIES TECHNICAL INSTITUTE 1609 south western avenue • los angeles 6, california

World's Oldest and Largest Plastics Technical School

THIS MERGER fulfills a long-felt and growing need in the Plastics Industry for a source of well-trained, versatile engineering and technical personnel. With the combined facilities of the College of Engineering of West Coast University and of Plastics Industries Technical Institute, training in plastics technology will be offered on the following three levels:

- 1. The West Coast University nine-semester course in Mechanical Engineering with specialization in Plastics Processing, leading to the Degree of Bachelor of Science. This course may be completed in three calendar years.
- The intensive Plastics Institute four-month course in Plastics Fabrication for resident students. Eight months of additional advanced training leads to the Certificate of Plastics Technician.
- 3. The Plastics Institute one-year Home Study course for up-grading plastics industry personnel, or as preparation for worth-while employment in the industry.

all courses approved for veterans and non-veterans

west coast university invites the cooperation of the plastics industry in the continuing development and improvement of practical programs of plastics education and training.

#### RALPH HEMPHILL

President, West Coast University

### VICTOR ELCONIN

Dean, College of Engineering, West Coast University

#### JOHN DELMONTE

Technical Director, Plastics Industries Technical Institute



# BENDIX Zaves 8 ways

th SPEED

SAYS MR. WALLACE F. OLIVER.

Vice-President and Director of Engineering, Bendix Home Appliances, Inc.

E HAVE LEARNED from experience that SPEED NUTS provide eight important savings in the production, assembly and servicing of Bendix home appliances . . .

- © SPEED NUTS save time by simplifying our design problems . . . @ reduce our total assembly time because they start easier, pull
- down faster and do not have to be held with a wrench o provide blind location attachments that take less time, less skill . . .
- e save us the investment in expensive welding and riveting equipment . . .
- a reduce our materials costs by performing multiple fastening
- ing strength or rigidity . . .
- minimize shipping damage to our products by protecting fastening against vibration loosening . .
- and . . . save our servicing time because they will not "freeze" to bolts or screws exposed to corrosion.

"In the blueprint stage . . . that's where we always specify SPEED NUTS. We take full advantage of Tinnerman engineering service, too, making certain that we achieve the utmost in assembly efficiency."

It's possible that SPEED NUTS can provide valuable savings in your assembly operations. Call your Tinnerman representative for details on our Fastening Analysis Service—he's listed in major city telephone directories. Tinnerman Products, Inc., Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton. In England: Simmonds Aerocessories, Ltd., Treforest, In France: Aerocessoires Simmonds, S. A. Paris.

PRE-LOCKED POSITION

**Arched Prongs** 

Speed Nut PRINCIPLE

THE

DOUBLE-LOCKED POSITION

Compensating Thread Lock





Eleven SPEED NUTS, 7 Latch-type and 4"U"-type, are attached to washer front panel at high rate of 65 panels per bour. Blind location attachment of door sections and lower front panels are then accomplished



in the storage rack—that's where "U"-type NUTS are quickly and easily slipped on by hand, ready for vibration-proof attachment of these top panels of the Gyramatic Washer.



SPEED NUTS were specified for the new Bendix Gyramatic Washer while it was still in the blueprint stage . . . the result: maximum assembly savings.



titute

MORE THAN 4000 SHAPES AND SIZES

# It's a Toy — It's a Light — It Glows in the Dark





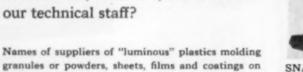
HERE is a practical toy and a useful flashlight in one. It is "A Light That Can't Get Lost." Molded for the Stuart Toy Manufacturing Co. by Cambridge Molded Plastics Co., using phosphorescent polystyrene (Lustron, Monsanto Chemical Co.)

# More and More Practical Items Are Being Added to the Line of Zuminous Plastics Products

Here are several more products that have been given the advantage of "glowing in the dark" after exposure to a light source—daylight or lamplight. In each case the "luminous" property makes the product more useful, easier to sell. Other practical applications for "luminous" plastics include safety signs and markers (for exits, fire escapes, fire fighting stations, and control points), switchplates, clock cases and dials, table tops, lamps and lampshades.

Perhaps you, too, have a product that can be made more useful or more decorative and, therefore, more salable. Why not discuss it with our technical staff?

request.



A copy of our booklet "101 Useful Luminescent Applications" sent free on request.





A GLOW that lures fish in darkened waters makes these "Luminous" Glo-Worms and Bait easy to sell. Made from rubber-like polyvinyl chloride (B. F. Goodrich Co.) by Porko Baits, Inc.





SNAPIT—the Feather Touch Bell Button with the Lumi-Glo Push that replaces old fashioned types is manufactured by Cable Electric Products. Inc.



The Horse Head Luminescent Pigments that MAKE these Plastics





When the Plastics Division of Continental Can Company decided to go after "big" molding jobs, they chose a 750-ton H-P-M semi-automatic compression press. Here's why...H-P-Ms require a minimum of floor space. No accumulators or connecting hydraulic pipe lines are needed... just fill the tank with oil and connect the motor to your power line and it's ready to go to work! The compact, heavy duty H-P-M radial pump supplies steady pressure which can be easily and quickly adjusted. Automatic ejectors eliminate time consuming manual effort. These are

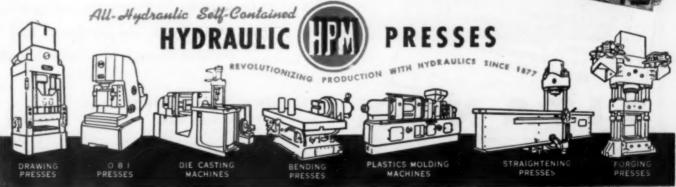
just a few of the many money saving features of high speed H-P-M presses.

You, too, can step-up production and eliminate costly rejects with modern H-P-Ms. Call in a nearby H-P-M engineer today!

### THE HYDRAULIC PRESS MANUFACTURING CO. 1010 Marien Road \* Mount Gilead, Ohio, U.S.A.

Write for a free copy of Bulletin 4802 describing H-P-M compression and plunger type transfer molding presses. Stock sizes are available for quick delivery.





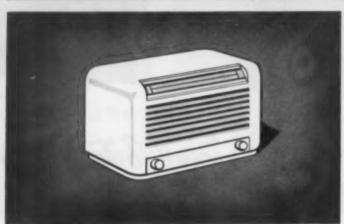
### TITANOX . . . the brightest name in tilanium pigments

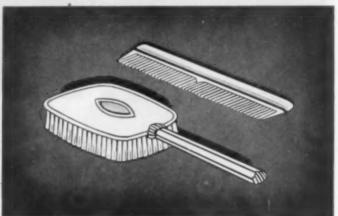
# TITANOX

make plastics WHITE BRIGHT DPAQUE



0





TIANOX is so effective that only a small amount is needed to impart to your plastic products maximum opacity, whiteness and brightness . . . or to control their translucency. These famous titanium dioxide pigments assure desirable lasting results in making items white, pastel or brightly colored. Their fine particle size, chemical stability and ease of dispersion make them a natural choice among compounders and manufacturers.

Take advantage of the facilities of the Technical Service Laboratory in choosing the proper grade of TITANOX

DELUSTERS Rayon

Rayon loses its gaudy shine
when it is delustered with
ITTANOX. The treatment is
permanent because this pigment is non-reactive in
processing baths.

### TITANOX

Reg. U. S. Pot. Off. 111 Broadway, New York 6, N. Y. 104 So. Michigan Ave., Chicago 3, III.

### TITANIUM PIGMENT CORPORATION SOLE SALES AGENT

for your products. The Laboratory staff is

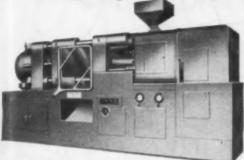
available through our nearest branch.

350 Townsend St., San Francisco 7, Cal. 2600 \$. Eastern Ave., Los Angeles 22, Cal.



# The only "completeline"

# of completely Hydraulic Plastic Molding



Equipment

HORIZONTAL MOLDING MACHINES









TRANSFER MOLDING MACHINES HOBBING PRESSES

No matter what process - or what plastic material you use - Watson-Stillman can supply molding equipment to fit.



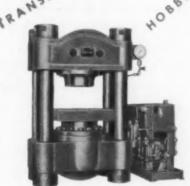
d

2.5

e

e

e



Horizontal Injection	8	to 80-oz.
Vertical Injection	1	to 4-oz.
Compression Molding50	to	1200-ton
Tableting Machine10	and	100-ton
Transfer Molding30	to	1200-ton
Hobbing Presses200	to :	3000-ton

Ask Watson-Stillman's advice on selecting equipment or in solving any plastics molding problem.

1848-CENTENNIAL-1948

Watson-Stillman

HYDRAULIC MACHINERY DIVISION

### FACTORY AND MAIN OFFICE ROSELLE, NEW JERSEY

BRANCH OFFICES

PHILADELPHIA, PA. CHICAGO, ILL.

KEPKE:
BIRMINGHAM, ALA George M. Meriwether
BUFFALO, N. Y Tri-Line Co.
CLEVELAND, O Frank T. Goetz Machinery Co.
DALLAS, TEX Perry Machinery Co.
DENVER, COLO Overgard Machine Tool Co.
DULUTH, MINN Anderson Machine Tool Co.
HOUSTON, TEX Perry Machinery Co.
INDIANAPOLIS, IND W. K. Millholland Machinery Co.
LOS ANGELES, CALIF H. M. Royal, Inc.
Foreign Cales Possession OMANI PRODUCTS CORP. 400 F.

PITTSBURGH, PA. . Stanley Berg & Co. PORTLAND, ORE. . W. R. Matthews Mach. & Tool Supply Co. ROCHESTER, N. Y. . . . . . Tri-Line Co. ST. PAUL, MINN. . 7. . Schellenbach Machine Tool Co. Anderson Machine Tool Co. SAN FRANCISCO, CALIF. . Schellenbach Machine Tool Co. SEATTLE, WASH. . W. R. Matthews Mach. & Tool Supply Co. SPOKANE, WASH. , W. R. Matthews Mach. & Tool Supply Co. SYRACUSE, N. Y. . . . . . . . . Tri-Line Co. TULSA, OKLA.

Foreign Sales Representative: OMNI PRODUCTS CORP., 460 Fourth Avenue, New York 16, N.Y. • Correspondents throughout the world MANUFACTURERS OF THE MOST COMPLETE LINE OF HYDRAULIC MACHINERYS



When WE get a blueprint from one of you lovely customers...we STUDY it! (The above scene is *not* in our shop...we allow no gambling whatsoever.)

Some blueprints we get are gorjus and a pleasure to follow... but some are enough to make strong men weep... or play tictae-etc. on 'em!

However . . . instead, we pore over these blueprints-by-Rube Goldberg until we make 'em come out right! We admit our Engineers are regular Tau Beta Pi's when it comes to modifying designs of pieces our Summa-

Cum-Louder Production Department is to produce for you ("X" pieces a day for the more days the merrier).

BUT... (here comes the "Hearts and Flars")
... won't you pleeeease let our bright Engineers in on your designs EARLY so that

- 1. YOU get the best doggoned molded plastic products at the lowest doggoned price . . .
- 2. WE snatch enough profit to help pay our rent and . . .
- 3. YOUR CUSTOMER is as contented as the Carnation Critter.

Boonton

THE BOONTON MOLDING COMPANY

Boonton 3, N. J.

Boonton 8-2020

MOLDERS OF MOST PLASTICS BY MOST METHODS

# Introducing

# SILKYSOL

# 2 GREAT NEW PLASTIC MATERIALS WITH UNLIMITED APPLICATIONS

When you examine these exciting, outstanding triumphs of plastics chemistry and engineering, you'll be amazed by their rich, pure color, their luxurious, silken texture and dull sheen.

SILKYSOL\* is a rayon fabric with a unique, waterproof plastic coating. Entirely adorless, Silkysol has extreme strength, is resistant to dirt, grease, acids and sunlight and is non-fading. It will not crack or peel, for the coating is securely bonded to the fabric base. Silkysol can be cut, sown, glued — in fact, treated like any other fabric for fabrication purposes.

SILCYL\* is the same superbly coated material, laminated to quality vinyl sheeting — with a layer of silky Fiberglas insulation sandwiched between. It is resilient, heat resistant, and can be fabricated in the same manner as Silkysol with the additional askantage of being heat scalable.

Uses to which you can put Silkysol and Silcyl are almost limitless. They are excellent for rainwear and umbrellas, for luggage and handbags, for upholstery and lawn and beach furniture. You can use them for draperies, wall coverings and other decorative offects. Employment as button or buckle covering, as package lining, as bookbinding cloth are additional and suggested applications for these unusually versatile materials.

Both Silkysol and Silcyl come in a full range of solid and pastel colors with smooth, brocade, herringbone or gabardine finish. Standard widths and various weights are available.



Swatches of Sifkysol and Silcyl are available for testing at no cost.

Write for them today

HERIBERT, INC.

155 Waverly Place

New York 14, N. Y

CHolma 2-5676-5586

NCE A PIONEER . . . ALV

\*Trademarks Registered



# MOSINEE

"More than Paper"

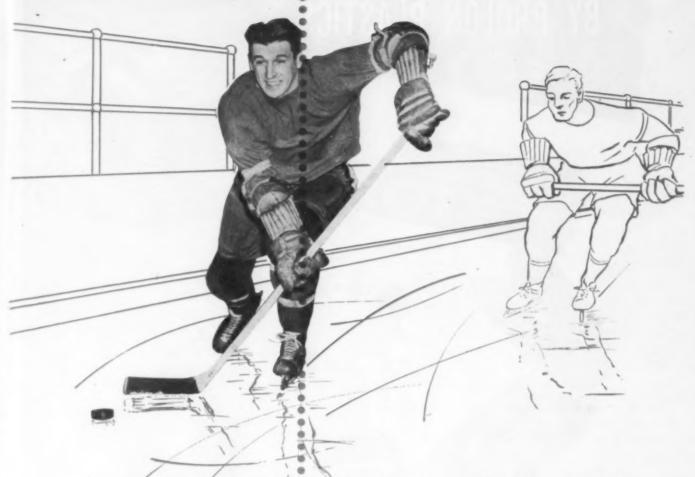
To the plastics industry, MOSINEE stands for paper-base processing materials with scientifically controlled chemical and physical properties, quality and uniformity . . . high tensile and tear strength with high absorptive capacity.

Other technical characteristics are controlled to meet specific plastics production requirements.

MOSINEE PAPER MILLS COMPANY . MOSINEE, WIS.

"Essential Paper Manufacturers"

### WINNERS HAVE WHAT IT TAKES



Nixon Cellulosic Plastics have what it takes . . . they are tough but they are also flexible, a pair of qualities which you find but rarely in the same material. A Nixon Cellulosic Plastic, for instance, is tough enough to stand up under hard service, yet it is flexible enough to be easily shaped and fabricated. Nixon Cellulosic Plastics are practical and economical to use. They tend to meet the varying requirements found in different applications. For your next molding or fabricating job consider one of the following Nixon Cellulosic Plastics . . . Nixon C/N (Cellulose Nitrate), available in sheets, rods, and tubes . . . Nixon C/A (Cellulose Acetate) and Nixon E/C (Ethyl Cellulose), available in sheets, rods, tubes, and molding powder. The Nixon catalog gives you further details about Nixon products. Send for your copy today.

IKE NIXON PLASTICS

ON WORKS . NIXON . NEW

York, Chicago, Detroit, St. Louis, Leominster . Sales Agents: NORTHWEST PLASTICS INDUSTRIES: Portland, Oregon; Seal dian Distributors: CRYSTAL GLASS AND PLASTICS, LTD., Toronto, Con. + Expart Distributors: OMNI PRODUCTS CORP., 460 4th Ave., N. Y. 16, N. Y.



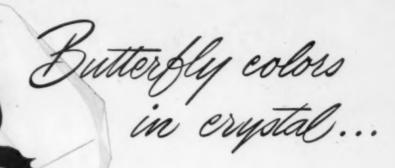
Whether the part be a small but complicated relay housing with exacting tolerances, or a beautifully finished radio cabinet, the customer benefits from Prolon Plastics' high standards in planning and production. Whether you need large or small moldings, by compression or injection, Prolon's specialized facilities and specialized knowledge can serve you well.

FOR BETTER QUALITY, BETTER SERVICE, WRITE TO

# PROLON PLASTICS

PRO-PHY-LAC-TIC BRUSH CO., FLORENCE, MASS.

RESEARCH \* DEVELOPMENT DIE-MAKING \* COMPRESSION AND INJECTION MOLDING



# A LOVELY, PROFITABLE MATERIAL FOR YOU!

It's hard to tell you how a material so beautiful and delicate can be so durable and wear-resistant, too.

Resproid is made in a brilliant array of colors that rival a butterfly's in beauty. These lovely shades are practical anywhere because dirt can be wiped off in seconds with just a damp cloth. And Resproid, guaranteed by Good Housekeeping magazine, gives you unusual resistance to cracking, fading, scuffing and abrasion — perspiration, most acids, alkalies, alcohol, oil and grease.

Resproid is made in a wide range of styles and weights—from translucent films to upholstery materials—that give new beauty, durability and sales appeal to shower curtains, waterproof garments, aprons, cottage sets, handbags, luggage, upholstery, belts—a variety of products as endless as your own imagination.

With a big, new, full-color advertising campaign in Good Housekeeping magazine telling over 8,400,000 potential customers per issue about *Resproid's* proven advantages, there's an increasing demand for *Resproid* products. If you're not already using *Resproid* in your lines, send for samples today. Respro Inc., Cranston 10, R. I.

Use the pink and black RESPROID tag to identify all your regular RESPROID numbers, and the yellow and black tag for the Fire-Resistant type of RESPROID. With RESPROID'S big ad campaign in Good Housekeeping, they're important selling points for you!

Resproid

# PLASTIC MOLDING

# FOR INDUSTRY

Production facilities include all types of molding equipment capable of handling every plastic material. This diversified equipment is backed-up with molding experience that began in 1891. When required, quotations can be given within 24 hours after samples or drawings are received. Call TECH-ART first for the finest in custom molding.

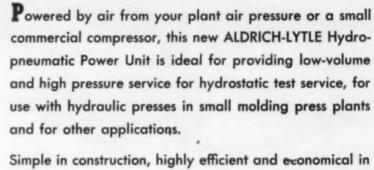
TECH-ART representatives in: Cincinnati • Cleveland • Detroit Kansas City, Mo. • Philadelphia Rochester • Washington, D. C.

TECH-ART PLASTICS COMPANY

41-01 36th Avenue, Long Island City 1, New York . AStoria 8-6050

# Here's a New Hydraulic Pump

For Hydrostatic Test Service For Use with Hydraulic Presses For Many Other Applications



Simple in construction, highly efficient and economical in operation — this unit uses a maximum of 100 lbs. of air pressure to provide up to 20,000 lbs. hydraulic pressure.

Varying pressures can be obtained by simple adjustment of self-contained air pressure reducing valve — can be maintained without need for control devices or by-pass valve. "Wire drawing" through relief valve and other complications are eliminated, since pump stalls when desired hydraulic pressure corresponds to air pressure used.



# THE ALDRICH PUMP COMPANY 6 GORDON STREET ALLENTOWN, PA.

Detailed information on this new unit is now available. Investigate the possibilities for its use in your plant by filling out and sending the coupon opposite.

(ALDAICE)



THE ALDRICH PUMP COMPANY 6 GORDON STREET . ALLENTOWN, PA.

Gentlemen: Please send me additional information on ALDRICH-LYTLE HYDROPNEUMATIC POWER UNITS.

Name\_\_\_\_\_ Title\_\_\_\_

Address



# and PLASTICS MAKE PERFECT!

WHEN YOU make a play for all the benefits that Plastics offer—let us help you plan and execute your attack. An experienced moulder's knowledge means just as much in planning as it does in actual production. It will smooth out design and production kinks—possibly cut costs—and certainly ensure a better, sweeter-running job.

We'll take full responsibility for reproduction of yourblueprints — quote a fair price on a job that will keep specified shipments of quality parts moving into your delivery docks at required dates. And with that quotation, we'll stake the 31-year-old Kurz-Kasch reputation for capability in plastics.

The Kurz-Kasch plant is large, modern and self-integrated for the design and production of any plastic part by compression, transfer or plunger moulding techniques. We're interested in your business — we'll send you a sales engineer at the drop of a hat — and we cordially invite your inquiry.



FINER ? Check these features and you be the Judge

DE MATTIA ALL-HYDRAULIC HORIZONTAL INJECTION PRESSES





- SOLID STEEL FRAMES FOR MAXIMUM STRENGTH AND RIGIDITY.
- STRAIGHT HYDRAULIC CLAMP PRESSURE OF OVER 400 TONS EMPLOYING A STANDARD 1000 PSI HYDRAULIC SYSTEM.
- \* HARDENED AND GROUND PLATEN GUIDES WITH GIBS TO TAKE UP FOR WEAR WITHOUT DISMAN-TLING.
- \* PUSH BUTTON CONTROL FOR FORWARD AND REVERSE MOTION OF INJECTION RAM.
- CONTROLLED SNUBBER ACTION ON BOTH MOVE-MENTS OF CLOSING PLATEN HELPS PROTECT MOLD FACES AND ALSO ADJUSTS SPEED OF EJECTOR MOVEMENT.
- MOLD OPENING CAN BE SET TO MINIMUM RE-QUIRED FOR FAST MOLDING CYCLES.
- \* CONTROLLED PRESSURE AND SPEED ON INJECTION RAM.

### SPECIFICATIONS

### DE MATTIA 12 OUNCE\* ALL-HYDRAULIC PRESS MODEL C 1

Material per Injection-12 ozs. (Styrene) . Plasticized Material per Hour-130 lbs. • Feed Hopper Capacity-60 lbs. • Pressure on Material-22,500 PSI . Mold Closing Pressure-400 Tons \* Max. Mold Size-18" x 25" . Max. Daylight-32" . Min. Die Space—8" • Max. Stroke—24" • Oil Pump Capacity-60 GPM @ 1000 PSI, Max. . Motor-30 HP . Complete Injection Time, Max.-3.3 Secs. . Injection Stroke Time, for Filling Mold-3.0 Secs. . Height of Machine, Overall-72" . Floor Space Required-172" x 42" . Approx. Weight-81/2 Tons.

\*Specifications on other capacities furnished on request.



MATTIA MACHINE AND TOOL CO.

CLIFTON . NEW JERSEY NEW YORK SALES OFFICE: 50 CHURCH ST. — CABLE ADDRESS: BROMACH, N.

INJECTION PRESSES . SCRAP GRINDERS . MOLD MAKING

# SHELL DUTREX 20

Plasticizer and Extender for Vinyl Resins and Buna N Synthetic Rubber



### SHELL OIL COMPANY INCORPORATED

Direct inquiries to:

50 WEST 50TH ST., NEW YORK 20, N.Y. (East of Rockies Territory)

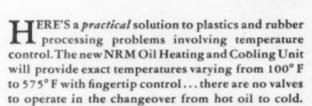
100 BUSH ST., SAN FRANCISCO 6, CALIF.
(Pacific Coast Territory)

SHELL OIL COMPANY OF CANADA, LIMITED 25 ADELAIDE ST., EAST, TORONTO, CANADA

# HERE'S A NEW ANGLE

...in plastics and rubber applications for heating molds, platens or die heads to 575° F with quick cooling facilities from a compact, easily installed and operated system.

YOU CAN SPOT THE NEW NRM OIL HEATING AND COOLING UNIT AT ANY DESIRED ANGLE FOR MAXIMUM OPERATING EASE AND TEMPERATURE CONTROL



Installation is simplicity itself . . . requiring only existing electrical service and a cold water supply line to the unit.

Extremely compact and completely flexible, the new NRM Oil Heating and Cooling Unit, together with the control panel, may be installed in exact proximity to the equipment it will heat and positioned at any desired angle to provide maximum ease of control for the operator.

Write today for more information regarding the ability of this unit to cut operating costs, eliminate costly installation for higher temperature requirements and reduce your maintenance expense.



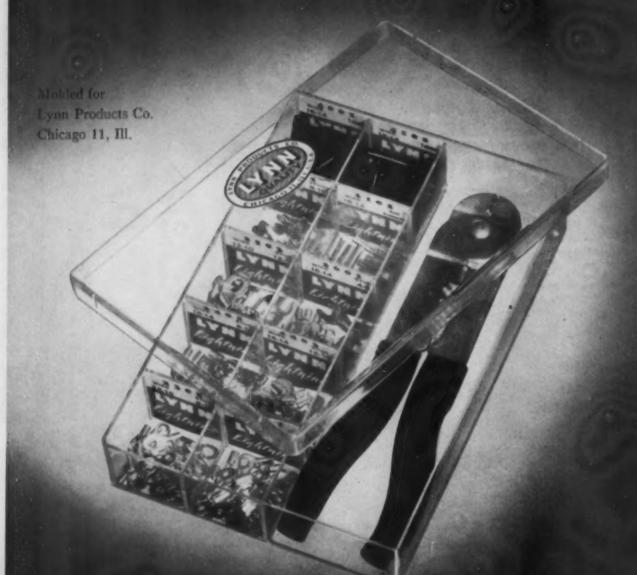
NATIONAL RUBBER MACHINERY CO.

General Offices: AKRON 8, OHIO



EXPORT DISTRIBUTORS: OMNI PRODUCTS CORPORATION, 460 FOURTH AVE., NEW YORK 16, N. Y.

# Packaging With INSIGHT!



"Out of sight, out of mind?" · · · Not if your product is packaged and displayed in a tough, durable box, injection molded from a crystal clear plastic.

SHOW your product and watch the sales curve climb.

Let MINCOR work out your packaging problem.

MINNESOTA PLASTICS CORP.
366 WACDUTA . ST. PAUL 1, MINN.





Here are three typical examples of resintreated products that have benefited by Interlake Resineering—the functional engineering of a resin for the specific job requirements. In every case, Interlake Resineering helps insure a product of top quality, made without production problems and using a resin that costs no more.

Basically Interlake Resineering consists of:

ANALYSIS of your resin problem followed by our recommendation.

- DEVELOPMENT of a resin suited to your particular application.
- 3. JOB TESTING this resin, in your plant, working with your men.
- STABILIZED PRODUCTION of the resin for uniformity in performance.

Avail yourself of this complete service by writing The Interlake Chemical Corporation, Union Commerce Bldg., Cleveland 14, Ohio.

### Basic Applications of Interlake Resins Include . . .

BONDING—wood, veneer, corestock, cellulose waste and fibrous materials.

SURFACING-wood, paper and fabric.

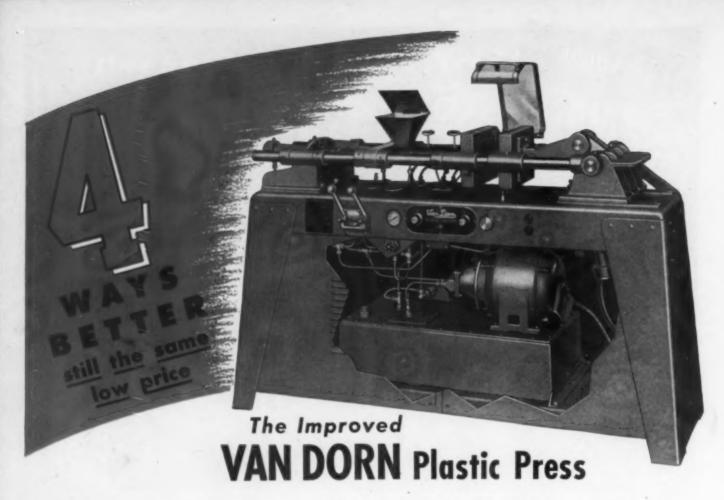
LAMINATING-fabric, paper and wood.

IMPREGNATING—wood, plaster and other cellular materials.

# INTERLAKE CHEMICAL

Corporation

· PRODUCTS FROM COAL ·



- 1. Spreader added to heating cylinder cuts heating cycles up to 50%.
- Hard Chrome Plating of interior of cylinder cuts resistance to flow of materials, protects against corrosive compounds.
- New Relief Valve—set at 1500 P.S.I.—insures maximum clamping pressure always, permits separate adjustment of injection pressure.
- 4. New Needle Valve increases gage life, by allowing gage to be shut off except for periodic checks on pressure.

\* \* \*

With the addition of these four new features, this Van Dorn Press is unequalled in the 1 oz.-capacity class for molding practically all thermoplastics including nylon. This remarkably economical press—

Costs under \$2000

Operates 8 hours for under a dollar

Uses less expensive molds

Can be set up by one man in 20 minutes

This Van Dom Injection Press is unexcelled for profitable production of small parts, and "pilot" or experimental runs on bigger jobs.

We make mold bases for Van Dorn Presses.



FREE BULLETIN tells all the facts.

Write for it.



30



### This is hard-headed business

### ANOTHER REASON FOR GOOD FYEAR LEADERSHIP

When a couple of charging young gridiron giants go crashing into each other head on, those helmets better be made of stern stuff. Otherwise, somebody could get hurt.

Don't worry about the players you see going into action here. Each is protected by a headgear made of a remarkable new kind of plastic material, developed by Goodyear. This unique product is appropriately called "Tuf-Lite." Despite its light weight, "Tuf-Lite" has terrific impact strength and long life. You can slam one of these helmets down on the hardest floor and it keeps bouncing back for more!

Unlike leather, this new material will not absorb water. It is available in a wide variety of attractive, long-lasting colors. Besides helmets, "Tuf-Lite" is being used in shoulder pads, knee pads and shin guards. It's also used for golf club heads and in other places where high impact strength is essential.

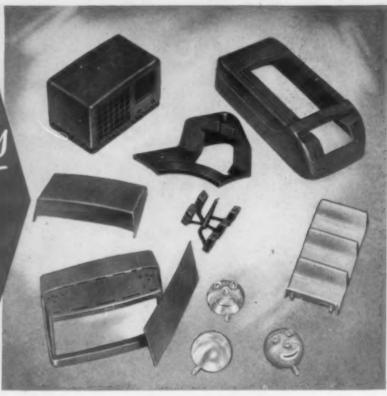
Developing a new plastic material for better sports equipment emphasizes again the sweeping scope of Goodyear activities today. While these activities are found in widely diversified fields, the objective is always the same — to develop new products that will serve you better.

For 50 years a leader in rubber, Goodyear also has broad experience with metals, fabrics, plastics, chemicals . . . making sure that all Goodyear products are better today than they were yesterday,

GOOD YEAR

THE GREATEST NAME IN RUBBER

# LET OUR Skilled Engineers LEND YOU VALUABLE AID!



TAKE advantage of Santay's unusual skill and experience! Without obligation, our engineers will gladly give you ideas, suggestions and cost estimates on any part or product in which an injection molding, metal stamping, or electro-mechanical assembly is involved.

Over a quarter-century of experience in fine tool making is a PLUS value appreciated by the impressive list of customers we serve. During this time our facilities have grown to large proportions. Unique methods and machinery have been developed. These, together with the constantly increasing skill of SANTAY craftsmen assure the success of ANY precision job, however simple or intricate it may be.

Complete SANTAY service includes: 1. Correct engineering, 2. Materials selection together with methods of preparation and handling reduced to an exact science, 3. Set-up of tools and presses often including unique procedures which result in vastly improved injection moldings, 4. Constant supervision of expert engineers, 5. Finishing performed according to better methods developed by the SANTAY research staff.

REMEMBER SANTAY whenever "Precision Craftsmanship" is required on an injection molding, metal stamping, or electromechanical assembly!



NJECTION MOLDING AND METAL STAMPING . ELECTRO-MECHANICAL ASSEMBLIES

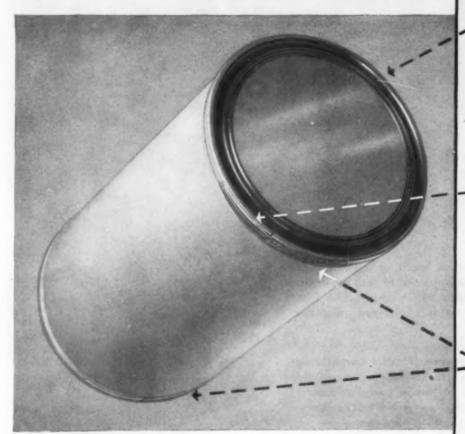
### SAVIAY CORPORATION, 355 AORTH CRAWFORD WE CHICAGO 24, ILLINOIS

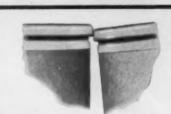
REPRESENTATIVES: BURTON SALES CO., BRISBANE BLDG., BUFFALO 3, N.Y. • QUEISSER BROS., 110 E. 9th ST., INDIANAPOLIS 2, IND. • PAUL W. SEILER
15533 WOODROW WILSON, DETROIT 3, MICHIGAN • C. E. WHITE & CO., BULKLEY BLDG., CLEVELAND 15, OHIO. • WILLIAM S, RICHARDS COMPANY,
4901 DELMAR BOULEVARD, ST. LOUIS B, MISSOURI • E. J. EDMUNDS, 5344 IRVING STREET, PHILADELPHIA 39, PENNSYLVANIA

# ANNOUNCING continental's improved

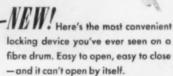
# LEVERPAK DRUM

with "flat contour" locking band for better stowing and shipping





The smooth, flat contour of the new, wide locking bands insures compact loading and safer riding in transit.





MEW! Metal chimes now flash butt welded for greater strength and neater appearance.



NEW! Advances all along the line
—improved materials, processes, techniques and equipment.

Here is the best-looking, most serviceable fibre shipping drum we have ever produced. From its newly designed cover—secured by the new "flat contour" locking band—to its easy stacking base, the improved Leverpak drum is engineered for rugged use and re-use.

If you have a dry product to ship, the improved Leverpak is the drum to ship it in—for greater product protection, easier handling, better

appearance and all around efficiency. May we send you the full details on the Leverpak drum and its shipping mates, the all-fibre Fiberpak drum and the redesigned metal-end Stapak drum? A postal card will bring you the full story without obligation.



### CONTINENTAL CAN COMPANY

The Container Company Division

VAN WERT, OHIO

SALES OFFICES: NEW YORK - PHILADELPHIA - CHICAGO CLEVELAND - PITTSBURGH - ST. LOUIS - LOS ANGELES

# UNIQUE PLASTIC PARTS ARE MOLDED ON LESTERS

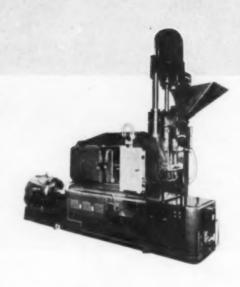




The specifications of an injection molding machine are only the cold indication of the potential of that machine. The vital facts of the machine's ability to produce fine plastic parts come from the molders who are using the machine in the field.

The units illustrated above are elastomeric Vinylite brush nozzles, molded by Modern Plastics Corporation for the Hoover Company. These unique, non-rigid parts have been designed so that a complete nozzle attachment and brush holder is molded in one piece. Lester machines have been used exclusively in the production of this part. The inherent temperature control characteristics and the stream-lined design of the internally heated cylinder have resulted in rapid production of parts that are flash-free and of exceptionally fine finish.

When Lester-Phoenix points proudly to the proficiency and capability of Lester Injection Molding Machines, it is with the full knowledge that scores of molders and hundreds of products will substantiate these claims.



#### REPRESENTATIVES

MELWESE	14.17	41							
New York	t .	0	0	0		0	Steven	F. 1	Crould
Chicago .							Elmer C.	Ma	ywale
Detroit .	*	*	*	*		8	Thores	on-N	cCost
Cincinnati					In	de	x Machin	пегу	Corp
Los Ange									
Leominster			×			×	Standard	d To	ol Co.
Cleveland					0	0	Don W.	. Wi	lliams
San Franc	isco	, (	ol.				. J. I	Frase	er Ros
Philadelph									

### FOREIGN

Toronto,	Canada			Modern Tool Works, Lt	td
London,	England			. Dowding & Doll, Lt	d
Calcutta,	India		0	. Frances Klein & C	0
Sydney,	Australi	a		. Scott & Holladay, Lt.	d



# ESTER INJECTION MOLDING MACHINES

Distributed by Lester-Phoenix, Inc.

2621 Church Avenue

Cleveland, Ohio

RESINS PHENOL CH<sub>2</sub>O **VARCUM** VARCUM C 86 RESINS VARCUM with VARC A phenol-formaldehyde resin in powder form, recommended A phenol-formaldehyde resin in powder form, recommended for use in rubber compounds to give added abrasion and wear resistance. SINS resistance. pink powder Specifications: VARCU 60° - 66° C 70 - 80 mm # VTP 1-c 35 - 45 sec VTP 11-0 Softening point > 0.1% VTP 4-a-1 95% thru 200 VTP 18 Flow VTP 10-0 IS Cure Ash Screen test Soluble in lower alcohols and ketones. Insoluble in hydro-Soluble in lower alcohols and ketones. Insoluble in nydro-carbons but soluble in mixtures of aromatic hydrocarbons Solubility: VARCUM with alcohols or ketones. Recommended for use in rubber tile flooring and hard rub-Varcum also has available other resins such as Varcum 9825,
Varcum 5165 and Varcum 2261 for special applications with sub-Uses: Varcum also has available other resins such as Varcum 9825, Varcum 5165 and Varcum 2261 for special applications with rubber formulations. VARCL ber for bonding, adhesives or hard rubber formulations. Write for test-size samples of these resins on your company stationery. VARCUM Corporation RESINS VARCUM uH20 CH<sub>2</sub>O RESINS VARCUM PHE

# 12 AIDS to better, more economical molding from METASAP MOLD LUBRICANTS



Photo Courtesy Boonton Molding Co., Boonton, N. J.

**METASAP STEARATES,** flowing under heat and pressure to the surface of your compound, assure . . .

... 4 AIDS TO EASIER PRODUCTION ... (1). No sticking during rolling. (2). No shut-downs to scrape off mills. (3). Operation at lower pressure during molding. (4). Easy release from mold; Metasap can also be "dusted" on molds to prevent sticking.

... 4 AIDS TO ECONOMICAL PRODUCTION ... (1). Increased

molding cycles. (2). Greater production—fewer rejects. (3). Better flow saves resin. (4). Longer die life.

... 4 AIDS TO QUALITY PRODUCTION ... (1). No staining of molds results in smoother-finished molded products. (2). No "blooming". (3). Greater penetrability also improves finish. (4). Metasap is long experienced in adapting stearates to individual needs.

▶ Plants requiring intricate mold designs and precise fabrication particularly need Metasap's improved internal and external lubrication.



For complete information, write:

METASAP CHEMICAL COMPANY, HARRISON, N. J. . CHICAGO . BOSTON . RICHMOND, CALIF. . CEDARTOWN, GA.

Stearates

of Calcium · Aluminum · Lead · Magnesium · Zinc

### - nothing short of being best ...

#### ABBOTT LABORATORIES

North Chicago, Illinois.

uses this PLASTIC CAP as a functioning part of highly specialized hospital equipment, and it must be right! "Many things difficult to design prove easy to performance."

Thanks to Samuel Johnson for a good, if unintentional description of the ingeniously designed Abbott Venoclysis Equipment — which, together with Abbott Intravenous Solutions is the choice of many hospitals.

★ The above is an excerpt from a professionally directed Abbott advertisement.



#### A Versatile Bit of Equipment, states ABBOTT



This dispensing cap, in conjunction with rubber tubing, is used for venoclysis. It is designed to fit all Abbott bottles containing intravenous solutions. A versatile bit of equipment, it makes possible several different variations in venoclysis technique.

This compact cap permits introduction of supplementary parenteral medication directly into the flow without disturbing the patient. It can be used with one bottle, or hooked up with additional bottles, in series. The sketches to the left, reproduced through the courtesy of Abbott Laboratories, show these caps as installed and arranged for a two-

bottle series hook-up.

## This Piece is our Salesman for more Plunger Molding

When you plan molding, consider the plunger method—and call Consolidated. By plunger-processing this intricately designed and threaded part of black Bakelite, we maintained precision quality, used fewer cavities, lowered tool costs and, through shortened cycles—increased production.

Of prime importance is the fact that the customer is well pleased . . . and the equipment well served. As a result of this and other Consolidated-solved problems, we invite the opportunity to apply our know-how to any and all custom molding assignments—plunger, compression, injection. Our experienced sales engineers are at your service. Inquiries invited!

Consolidated

MOLDED PRODUCTS COMPANATION
309 CHERRY STREET,
309 SCRANTON 2, PA.

YOUR BLUEPRINT

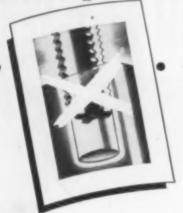
GM P

IN PLASTIC

Branches: NEW YORK, 1790 Broadway - CHICAGO, 549 W. Randolph St. - DETROIT, 550 Maccabers Bldg. - CLEVELAND, 4614 Prospect Av. - BRIDGEPORT, 211 State Street.

PRODUCT DEVELOPMENT . MOLD DESIGN . MOLD CONSTRUCTION . PLUNGER MOLDING . TRANSFER MOLDING . INJECTION MOLDING . COMPRESSION MOLDING

Gets clear picture of fastening handicaps



SKIPS JOB-SLOWING OPERATIONS — SAVES 35%

Galter Products Co. needed a fast, economical fastening method to keep assembly costs down on their line of popular-priced Spartus Cameras.

They decided the extra time and tool cost of needless tapping didn't make sense. Neither did mold-slowing inserts in the plastic units. So they turned to P-K Selftapping Screws as the "common sense" selection. Assembly cost savings were estimated at 35%.

With P-K Screws, you can skip such job-slowing operations, give highly-paid assembly hands a head start. Often, they add strength and permit improvements in design.

Look over the fastenings in your products. If you are now tapping, molding inserts in plastic, or using other work-slowing operations, chances are you can make similar savings with the simpler P-K fastening method.

Call in a P-K Assembly Engineer. In 7 out of 10 cases, he can demonstrate that P-K Self-tapping Screws will save up to 50% in assembly work-hours. If you prefer, mail assembly details for recommendations. Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

> PARKER-KALON PRODUCTS Sold Only Through Accredited Distributors



In this Spartus Press Flash Camera, four Oval Head P.K Type "Z" Screws fasten the metal name plate to bakelite case. Two Binding Head Type "Z" Screws fasten

shutter to case. Three Binding Head Type "Z" Screws fasten bulb contact and wire connection to case. Two Round Head Type "Z" Screws fasten lens to tenite lens mount. P-K Self-tapping Screws are similarly used in all



ARKER-KALON

RKER-KALON PRODUCTS COLD-FORGED SOCKET SCREWS, WING NUTS, THUMB SCREWS . HARDENED SCREWNAILS AND MASONRY NAILS SHUR-GRIP FILE AND SOLDER IRON HANDLES . METAL PUNCHES . DAMPER REGULATORS AND ACCESSORIES

# putting PLYON\*

PLYON plays a dozen important roles in the current ICE FOLLIES OF 1949, the original traveling ice extravaganza that will be seen by three million people in 18 cities from coast to coast.

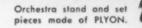
The Shipstads and Johnson, producers and originators of the ice show idea, have selected PLYON above all other materials for the third successive season because:

- PLYON IS DURABLE—withstands the most rugged treatment—tough enough to take the terrific impact of high speed steel skates.
- PLYON RESISTS MOISTURE while excessive dampness in ice arenas rapidly breaks down other materials, PLYON stands up without deterioration.
- PLYON IS LIGHT—the ICE FOLLIES' many changes of scene require settings and set-pieces of extreme light weight. Featherweight PLYON is perfect for this purpose, as well as for economy of shipment.
- PLYON HAS BEAUTY—it can be moulded into endless graceful forms, takes color perfectly, either by dyeing or painting, and is translucent to light.

\*PLYON is obtainable in various resin formulations and filler constructions which may consist of Nylon, Fiberglas, Cotton and Paper, singly or in combination.

Call or write us your requirements. We'll be glad to help you solve your problems with PLYON or FABRICATED ACRYLICS. (The sets and properties for the Ice Follies were fabricated of PLYON by the Studio Prop Shop, Burbank, Calif.)

Swellow PLASTICS CO.





"Bang board" around rink made of PLYON

3757 WILSHIRE BOULEVARD . LOS ANGELES 5, CALIFORNIA

Leaders and pioneers in laminated plastics and ACRYLIC fabrication



Greater resistance to heat and light . . . to cold, aging, vils, acide, foods, other destructive factors . . . are features of products made from Marvinol resins.

### MAKING PRODUCTS FROM VINYL RESINS? you'll get more of everything with MARVINOL®

If you're making plastic or elastomeric products from vinyl resins, it will pay you to read these facts about Marvinol... the resin that gives you more of everything.

#### More Stability!

Marvinol offers superior stability in processing and in end product. High molecular weight gives it extra toughness and "dryness"... yet it is easy to calender, extrude, injection mold, disperse, or process into unplasticized rigids. Plastics made from Marvinol are easily cleaned... show less heat deformation, have greater low temperature flexibility... may be

opaque or transparent, brilliantly or delicately colored.

#### More Uniformity!

Marvinol resins are a development of Martin research and Martin's quarter-century of plastics experience . . . the same research and experience that developed the Mareng flexible fuel tank for aircraft. They're being produced in the world's most modern chemical plant to assure you of unexcelled uniformity. And

they're backed by the Martin reputation for quality of product,

#### More Cooperation, too!

The Glenn L. Martin Company does not compound or fabricate in the plastics field. Sales engineers and a fully equipped modern customer service laboratory offer maximum technical cooperation. Write on your company letterhead to: Chemicals Division, Dept. MP-11, The Glenn L. Martin Co., Baltimore 3, Maryland.

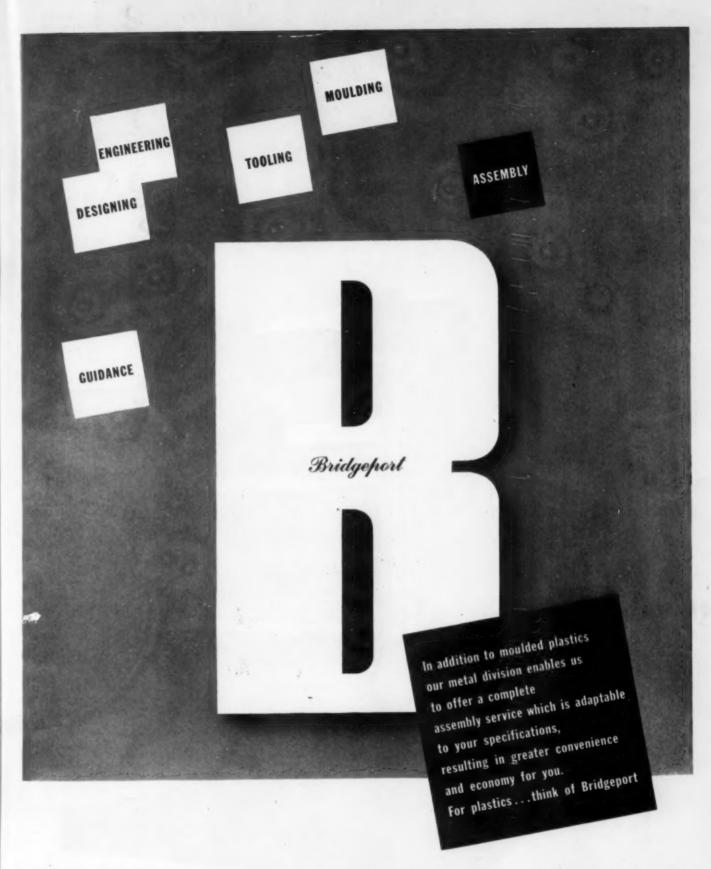


RESINS, PLASTICIZERS AND STABILIZERS PRODUCED BY THE CHEMICALS DIVISION OF
THE GLENN L. MARTIN COMPANY . AN INTERNATIONAL INSTITUTION
"BETTER PRODUCTS, GREATER PROGRESS, ARE MADE BY MARTIN."

MANUFACTURERS OF: Martin 2-0-2 airliners....Advanced military aircraft....Aerial gun turrets....Marvinol resins (Martin Chemicals Division)

DEVELOPERS OF: Rotary wing aircraft (Martin Rotawings Division)....Mareng fuel tanks (licensed to U. S. Rubber Co.)....Honeycomb construction material (licensed to U. S. Plywood Corp.)....Stratovision aerial rebroadcasting (in conjunction with Westinghouse Electric Corp.)

LEADERS IN RESEARCH: to guard the peace and build better living in many far-reaching fields.



### BRIDGEPORT MOULDED PRODUCTS, INCORPORATED

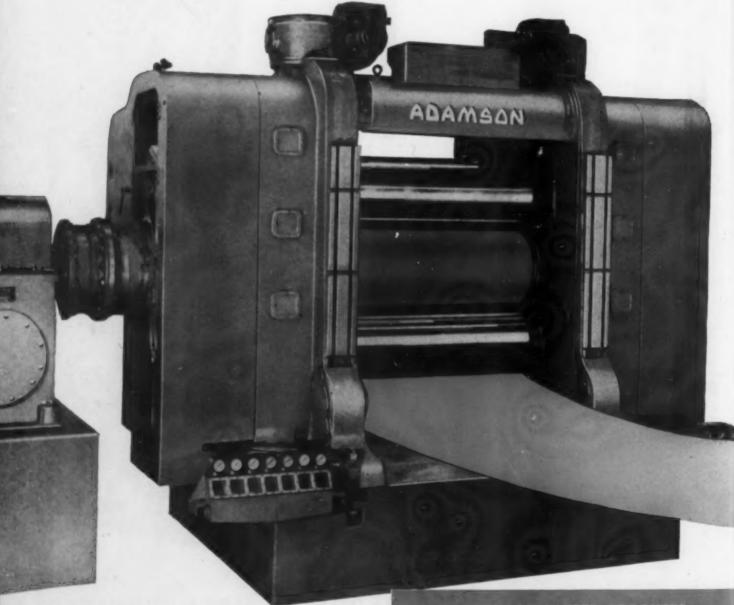
BRIDGEPORT



CONNECTICUT



## new Adamson Calenders



 $24^{\prime\prime}$  x 68" Standard 4-Roll Calender with flood lubricated roll bearings; even and friction connection gears, and Cone Worm Drive direct connected to middle roll.

#### ADAMSON UNITED PRODUCTS FOR THE PLASTICS INDUSTRY

- 28" x 84"

CHIC

Ple

ęq

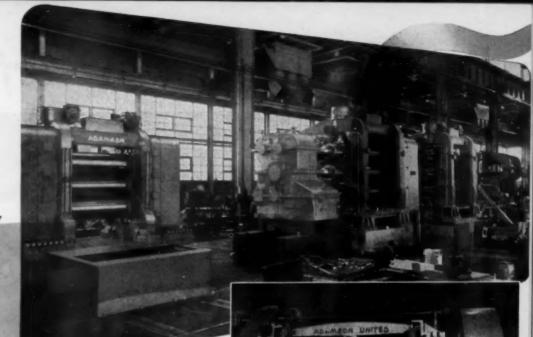
TI

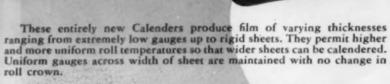
op

Calender Assembly Floor, New Castle Plant.

24" x 68" Std. 4-Roll Calender in foreground . . . three Precision Type 4-Roll Calenders in background.

# For sheeting unsupported Plastic Film





#### THE NEW 24" x 68" STANDARD 4-ROLL CALENDER

This modern unit is ideally suited for the manufacture of standard types of unsupported film and for the coating of fabrics. It is capable of producing the finest quality product at high production speeds. Some outstanding features are:

- High capacity drive direct-connected to center roll.
- \* Pre-loaded roll bearings.
- · Ne-leak oil seals.
- Temperature control of bearing lubricant.
- · Precision roll adjustment.
  - · Pre-loaded adjusting screws.
- Rugged frame; oversize bearings.
- · Compact floor arrangement.

#### ALSO A NEW PRECISION TYPE 4-ROLL CALENDER

Carefully selected and pre-loaded roller bearings support the rolls with no bearing clearances and are adjusted for high temperature operation. Hydraulic Jacks positively position the bearings against the adjusting screws. Precision Cone Worm reduction units and individual motors operate each adjusting screw.

Rolls are separately driven from a gear stand through universal cou-plings, allowing free adjustment without disturbing the position of the gears. These operate in a separate case, and on fixed centers, to that teeth can be cut with a fine pitch.

The Roll axes are crossed by a special cambering attachment. This compensates for roll deflections due to varying stock plasticities or Calender speeds, and avoids the necessity of re-grinding rolls to different crowns for any of these changing conditions.

The rolls, with their anti-friction bearings, can be quickly detached from the universal couplings and removed from the frames. A special roll-changing device can be provided for this purpose.

We design and supply entire calendering process systems including all accessory equipment. To assure our customers the earliest possible delivery of precision-built plastics processing equipment, we have combined the facilities of six great plants, each operated by personnel with years of experience in the building of heavy machinery. From these plants the various components of steel and iron castings, gears, chilled iron rolls and other parts are assembled at New Castle.

Complete details on the Calenders and Mills illustrated, or on any other equipment we manufacture, will be furnished on your request.

#### ADAMSON UNITED COMPANY AKRON, OHIO

SUBSIDIARY OF UNITED ENGINEERING AND FOUNDRY COMPANY Plants at: PITTSBURGH . VANDERGRIFT . NEW CASTLE . YOUNGSTOWN . CANTON

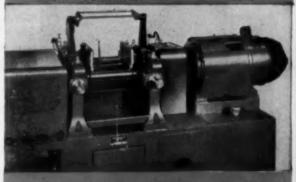
**BRANCH OFFICES** NEW YORK: 441 Lexington Avenue New York City
CHICAGO: 140 South Clark Street,



LOS ANGELES: 5140 Crenshaw Los Angeles, 43, California PARIS: 5 bis Rue Massenet, Paris 16e, France

r guide and pnoumatically op can be moved against or a





## Better Plastic Mill Performance

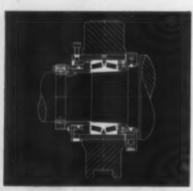


## Reduced Maintenance

Everything else being equal, plastics mills equipped with Timken balanced proportion roll neck bearings are consistently superior in operation; are more dependable; last longer; cost less for operation and maintenance.

Mills are more rigid because Timken balanced proportion bearings make possible larger roll neck diameters, with 50% to 60% increased roll neck strength. Load ratings are higher, too - up to 40% higher than previous designs of tapered roller bearings, size for size.

The photograph shows a typical example of a modern Timken bearing equipped plastics mill. It was designed and built by Dominion Engineering Works, Montreal, Canada, and is installed at the plant of Canadian Resins and Chemicals Limited, Shawinigan Falls, Quebec. There is a standardized Timken bearing application ready for your new or existing mills. Consult the mill builder or our engineers. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "Timrosco".



NOT JUST A BALL O NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL O AND THRUST - D- LOADS OR ANY COMBINATION - D-





## **COLORED PLASTICS INSTANTLY**

## . . . with amazing NEW UNICOLOR for vinyl, polyethylene and Geon\* Extrusions

Now extruders can say good bye forever to those long spells of halted production caused by delayed deliveries of colored Geon, polyethylene and vinyl plastics. With revolutionary UNICOLOR, the new-principle colorant, you can color plain plastics instantly to any shade you wish. All that's necessary is to keep on hand small stocks of UNICOLOR in the colors you will need for present and future runs.

Moreover, colored plastics made the UNICOLOR way cost from 3 to 4 cents less per pound than factory colored plastics. Why? . . . Because now you can order plain, uncolored plastics in low cost carload lots, then color portions as needed, for as little as four cents per pound.

UNICOLOR embodies an entirely new principle of coloring. It consists of granules of color saturated resins which possess exactly the same properties as the uncolored plastics with which you mix them. These granules actually form a molecular bond with the uncolored plastics. The resultant product has 100% uniform coloration, is blister and blemish-free, and possesses unchanged physical and chemical properties. UNICOLOR does not change extrusion rates, because it does not clog screens.

You can obtain UNICOLOR promptly in any standard color, or you can get it in colors which match your samples exactly.

You can't afford not to know about the time and money saving features of this remarkable new coloring material. That's why we suggest that you write immediately for complete details, samples and prices.

Address your inquiries to UNICOLOR DIVISION, Westchester Plastics, Inc., 326 Waverly Avenue, Mamaroneck, New York

Westchester
PLASTICS INC.
CUSTOM COMPOUNDERS OF
THERMOPLASTIC MATERIALS

\*REG. TRADEMARK, B. F. GOODRICH CHEM. CO.





## GERING MOLDING POWDERS

for MORE SATISFACTION
in Plastic Production



### THERMOPLASTIC MOLDING POWDERS

Compounded to achieve specific end uses.

Whether the product you mold is a cup, brush handle, fountain pen or any one of a thousand things, we prepare the powders to provide the essential characteristics in any desired flow.



Polystyrene Celluloss Acetate

Ethyl Cellulose

available in a wide range of colors.

Gering technicians are always ready to offer suggestions regarding blending of raw materials to provide stability and properties required for profitable thermoplastic production.

Send for samples, indicating the specific qualities required.

Large scale producers -

EVERY TYPE THERMOPLASTIC INJECTION POWDERS

CELLULOSE ACETATE—POLYSTYRENE— ETHYL CELLULOSE—BUTYRATE— VINYL & ACRYLIC Telephone: CRanford 6-2900

Cable Address: GERING, Kenilworth



GERING PRODUCTS, Inc.

NORTH SEVENTH ST.

KENILWORTH, N. J.

# DURITE

- \* RESISTANCE TO HEAT
- \* STRENGTH AND TOUGHNESS
- \* EXCELLENT COVERAGE
- \* DIMENSIONAL STABILITY
- \* UNIFORM CURE

DURITE Phenolic Resin was the bonding agent utilized in the cold molded Ship to Shore Cable Connector. Designed to withstand exceptionally rugged service demanded of this and similar applications.

THE BORDEN COMPANY

Chemical Division

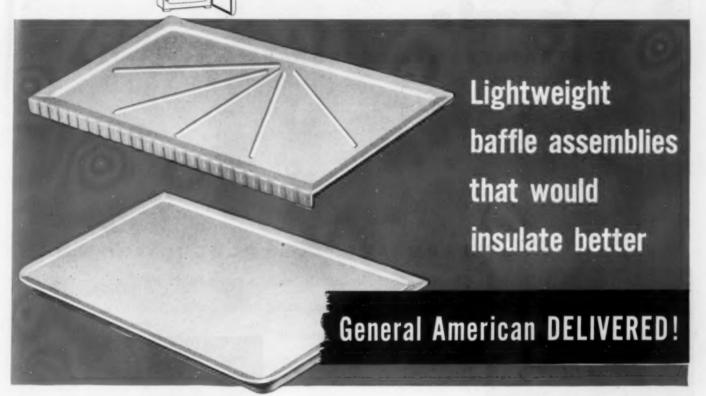
5000 SUMMERDALE AVE., PHILA. 24, PA.



## COOLERATOR and



## KELVINATOR needed:



A baffle assembly has a tough insulating job to perform. It separates the deepfreezing section of the refrigerator from the food storage compartment, and is constantly subject to temperature extremes as well as rust and chipping from constant use.

General American designed a new type of baffle assembly that provides more efficient insulation, prevents rust, eliminates chipping and costs less to produce than the old type. From dies built by General American, these baffle assemblies were molded on a 32 oz.

injection press. General American handled even the end operations, which consisted of cementing and—with the Kelvinator—filling the baffle assembly with fiber glass insulation.

General American customers benefit from more than 40 years of precision production experience. Modern high-speed equipment—2 to 32 oz. injection presses and 100 to 2000 ton compression presses—enables General American Plastics to turn out any type of plastics part or product quickly and economically.

PLASTICS



DIVISION

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street, Chicago 90, Illinois

New York City: 10 East 49th Street

Los Angeles: Richfield Building



Almost every day we learn of new uses for N E Extruders—Mixing Mills and Hydraulic Presses. Things we thought impossible a few years ago are ordinary practice today. We are as old as the rubber industry and as new as the newest plastic materials. N E — Tubers — Extruders — Strainers — Masticators—Grinders or whatever you choose to call them are processing everything from vegetables to hush hush explosives. The principle is the same, it's the speed, pressure and heat that makes the difference. It will pay you to call in N E engineers for they have learned that almost nothing is impossible.

#### PLASTIC STRAINERS and EXTRUDERS to SPECIFICATION







#### LABORATORY and PRODUCTION MILLS



The N E line of Mixing Mills offers a broad selection of equipment. We are able to assume full responsibility for we operate 3 complete steel casting

foundries and modern machine shops. From the smallest of laboratory mills to the largest of production mills, National Erie engineers can help you in your material processing work.



#### HYDRAULIC PRESSES TO SPECIFICATION









Write for Complete Catalog



## NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA . U. S. A



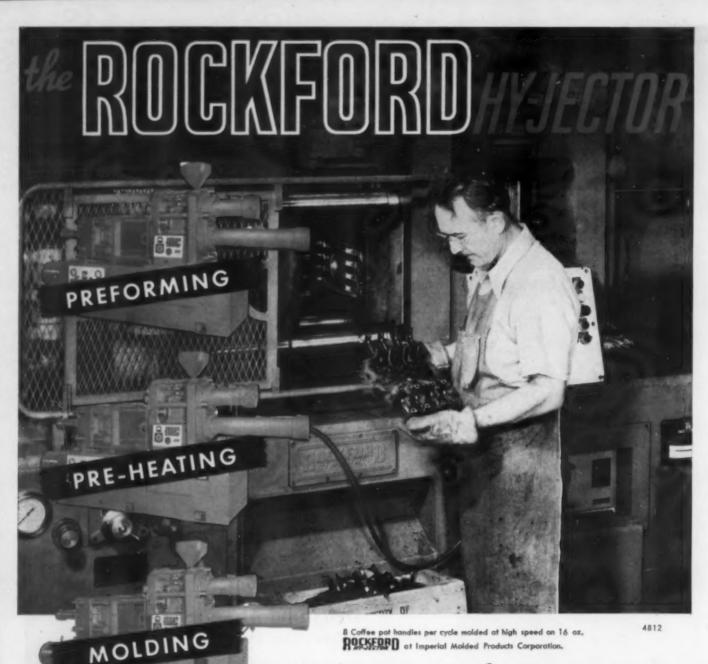




BEHR-MANNING

NORTON ABRASIVES

TROY, N.Y.



OF THERMOSETTING MATERIALS IN 1 HIGH SPEED CYCLE

8 oz. and 16 oz. Capacities Material is handled only once. It is loaded manually into the hopper and the operations of preform tabletting, electronic pre-heating and injection molding follow in automatic sequence. Molders like this clean, closely controlled operation of the ROCKFORD . . . as well as the high hourly production obtained from their molds—far higher than is possible on any other type of thermoset molding equipment. Write for details.

Ask about our 16mm. silent, full color movie showing ROCKFORD operation : . . now available for showing without charge to qualified technical groups.

ROCKFORD MACHINE TOOL CO.

ROCKFORD, ILLINOIS

ROCKFORD

DESIGNED AND BUILT BY
ROCKFORD MACHINE TOOL CO...
MANUFACTURERS OF Hy-Draulic
SHAPERS . PLANERS . SLOTTERS
SHAPER-PLANERS FOR METALWORKING

## The Proud Symbol of the Great New FORD



## Reproduced by ERIE in Everlasting "Three Dimensional" Plastics

A striking example of functional beauty is the three-color horn button on the '49 Ford. Passengers don't have to hunt for some sort of trademark and finally ask apologetically, "What kind of car is this?" There it is, as attractive as a rich jewel on milady's finger... as attractive as the sleek lines of the car itself.

Erie "Three Dimensional" Plastics have a distinction and quality that add to the appeal of any product on which they appear. Their permanent, untarnished beauty lends itself readily to a happy combination of utility, decoration, and identification.

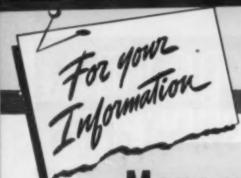
For a happy solution of your plastics problems, come to the Plastics Division of Erie Resistor.

Plastics Division

ERIE RESISTOR CORP., ERIE, PA.

LONDON, ENGLAND

------



## Monsanto Plastics go to WORK

Nothing delicate or fragile about workaday plastics that can take months and years of wear and tear. Monsanto plastics will do the toughest jobs designers of tools have in mind. For instance:



LUSTRON SAVES METAL IN THIS ABRASIVE FILE, molded by Industrial Plastics Inc., of Minneapolis, for The Handy Tool Co., Minneapolis, Leave it around the shop and you'll find that Lustron has excellent resistance to common acids, alkalies, salts and alcohols. It retains its high dimensional stability and has much more than adequate impact and tensile strength.



A RUGGED COMPANION PIECE in the workshop, is this handsander. Monsanto's thermosetting Resinox gives it the extra strength that's tough enough for applications such as casters, truck wheels and washing machine agitators. Resinox is low cost, and can be intricately molded to fit the hand and to accommodate inserts. The "Speed-Grits" sander is molded by Teal Molding Co., Westville Station, New Haven, Conn., for Behr-Manning Corp., Troy, N. Y.



AGAIN, MONSANTO'S LUSTRON fits perfectly into a workman's pockets. This carpenter's folding ruler is molded and sold by the Master Plastics Molding Corp., St. Louis, Mo. It demonstrates Lustron's light weight . . . lightest among all rigid plastics, and its economy . . . least expensive of all thermoplastics to use.



WATER FILTER by the Davis Manufacturing Co., Plano, Ill., combines the best features of two basic Monsanto plastics. LUSTREX, in the center section, gives it high dimensional stability, low moisture absorption and freedom from taste and odor. RESINOX, in the outer section, gives it extra high impact strength, excellent resistance to aging and chemicals. The filter shows how Monsanto plastics can be used together and economically mass-produced.

Resinox, Lustron: Reg. U. S. Pat. Off.

## CURTIS CREATES NEW BOARD FROM SAWDUST -- RESINOX



Curtis engineers created "Prespine" by combining selected wood waste with Monsanto's Resinox phenol formaldehyde plastic in powder form. The finished product is molded under heat and preseure. Now, "Prespine" is used in many products of the Curtis line . . . famous since 1866. "Reg. U. S. Pat. Off. (Curtis Companies)

Sawdust goes back to the original! Now plastics bind up sawdust, harden it into new, tough, workable board of tremendous importance to material-starved builders. Yes, it can be nailed, hammered, sawed and glued. It can be painted and stained. And Monsanto's Resinox keeps it strong and usable. Now everything but the zzzzz of the saw is being used!

Here's what Curtis engineers proved about "Prespine." "No wood product has received more grueling tests than Prespine. It's been boiled and frozen . . . subjected to heavy impact . . . exposed to weather for months . . . it won't mar or scratch readily . . . won't splinter or chip at edges . . . it has superior bending strength, resists warping, shrinking, swelling."

#### What "PRESPINE" means to You

If building's your business, "Prespine" panels will show you a new material for interior and exterior woodwork. "Prespine" is available only as used in Curtis production.

Whatever your business, "Prespine" is the tipoff on the profit possibilities with any one of Monsanto's 12 basic plastics. Curtis used Resinox plus sawdust. You can use plastics plus imagination to create new products and economize on old ones. You'll get all the help you need from Monsanto's scientists.

Monsanto plastics multiply into hundreds of thousands of profit-pulling end uses. Surely, it will pay you, then, to look into plastics for your own product.



## UP-TO-DATE and READY-TO-GO!

## Modern Refinery Equipped to Produce Avgas.. Butylene, Butadiene.. Aromatics

This refinery, built in 1944, is located in Cotton Valley, Webster Parish, Louisiana, about 45 miles northeast of Shreveport. It is reached by State Highway No. 90 and is served by the Louisiana & Arkansas Railway. The site consists of 31.7 acres, with adjoining land available for expansion.

This property is now offered for lease or sale as a whole for use in place.

#### PRINCIPAL EQUIPMENT

The main units of this refinery are:

(1) Dehydrogenation Unit with capacity of 750 to 1000 barrels per day of butylene, depending upon type of catalyst used.

(2) Alkylation Unit with capacity of 2200 barrels per day of aviation alkylate.

(3) Ethyl Blending Plant.

(4) Storage Tankage, Atmospheric: 191,000 barrels. Pressure: 51,000 barrels.

(5) Loading Rack with 2 sidings.

(6) Cooling Tower, Laboratory, Boiler Plant, Electric Power Generating Plant.

#### UTILIZATION

While these facilities are presently connected for the production of butylene concentrate, they were originally designed for the production of aviation gasoline and blending components. Their process line characteristics offer two additional potential utilizations:

(1) Production of butylene and butadiene from

butane, and

(2) Production of benzene, toluene, xylenes and other aromatics by synthesis from petroleum fractions.

SEALED BIDS for the purchase of this plant are invited. Write now to the address given below for necessary bidding instructions, for an illustrated brochure and for an appointment to inspect this refinery. All interested parties will be notified later as to the cut-off date for the receipt of sealed bids, and are invited to visit this office, located in the North American Plant, Grand Prairie (Dallas), Texas, for the purpose of examining the designs and specifications.

This advertisement is not a basis for negotiations and the Administration reserves the right to consider all proposals in the light of applicable objectives of the Surplus Property Act or to reject any or all bids. Any transfer of title will be subject to Executive Order 9908 relative to fissionable materials.





Write on your letterbead for the neu Injection Molded and Extruded Plastics Catalog. Or, for detailed information about WHAS PLOSTED\*, piping, tubing and fittings, write for circulars con-taining data and illustrations.

\*Trademark Registered

appealing displays such as this is but one phase of our many sided plastics molding skill.

Whether yours is a product for rugged industrial use-or an exquisitely styled feminine object-we can mold it to your greater satisfaction in our ultra-modern new plant. What's more, our precision craftsmanship and proper use of correct plastic materials assures you of better plastic products.

Our greater new facilities backed by richly varied molding experience are at your service. Let us help you solve your plastic problems without obligation.

NEW PLANT NEW ADDRESS

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacele, Fibestos, Lucite, Plexiglas, Nylon, Polystyrene, Styron, Lustran, Laalin, Vinylite, Geon, Plexene, Polyethylene, Cerex, Forticel, (2004) (1985) (1

2930 NORTH ASHLAND AVENUE . CHICAGO 13, ILLINOIS



## clearly --- a window on the World

For owners of Admiral Radio-Phonograph Television Sets, the world passes in review . . . sharp and clear behind this escutcheon plate molded by MPc. To meet UL safety requirements the window section must have a thickness of 1/4 inch. Yet it must come from the mold perfectly clear. By applying the compression molding process to this thermoplastic material, it was possible to produce the entire panel,  $14 \times 14 \frac{1}{2}$  inches, in one piece. The lettering and background were subsequently spray painted.

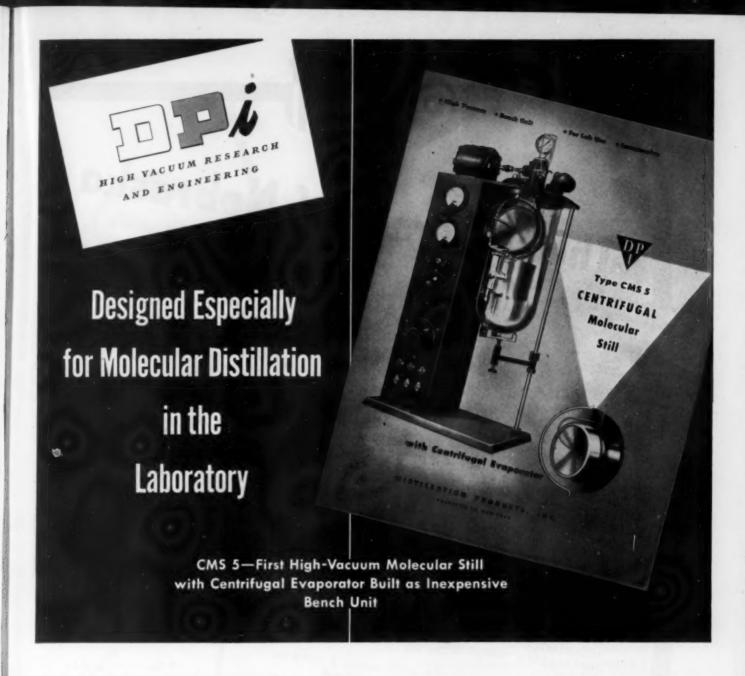
Here is another example of the engineering and production sagacity which enable us at MPc to take in stride the unusual in plastics tooling and molding. Submit your plastics product or problem to MOLDED PRODUCTS

CORPORATION, 4535 W. Harrison St., Chicago 24, Illinois.

INJECTION AND TRANSFER MOLDING

\*By Santay Corporation

MOLDED PRODUCTS



RESEARCH men in universities and in all industries who work with natural and synthetic substances will welcome this new tool—the CMS 5.

It provides the lowest thermal hazard for the distillation of heat-sensitive materials which are fluid above 100° C and whose molecular weights are greater than 200.

DPI makes this fine precision unit available at low cost expressly to enable the student and research worker to use the process of molecular distillation in his study of oils, resins, plasticizers, drugs, perfumes, vitamins, sterols, fatty acids, etc.

### DISTILLATION PRODUCTS, INC.

779 Ridge Road West • Rochester 13, N. Y.

Manufacturers of Molecular Stills and High-Vacuum Equipment; Distillers of Oil-Soluble
Vitamins and Other Concentrates for Science and Industry

### Send for Free Leaflet

. . . which gives full description of this complete, compact (3 sq. ft. by 32" high) unit, and shows how this still can be a useful addition to your present laboratory facilities.

Distillation Products, Inc. 779 Ridge Road West, Rochester 13, N.Y.	
Please send the CM	S 5 Bulletin to
Name	Title
Company	
Company	
Address	



## The Governor of Nebraska invites You





STATE OF NEBRASKA LINCOLN

In the last decade, Nebraska's pro-To American Industry: ductive capacity has grown threefold. Modern industry has found in increasing numbers that Nebraska's diversified assets form the economic cornerstone of a better

Here there is respect and reward for individual initiative, whether its hall-mark be overalls or a business suit. Netomorrow! mark be overalls or a business suit. Nebraskans prize ingenuity, cooperation and
braskans prize ingenuity, cooperation and
achievement. Their fundamental faith is
achievement by Nebraska government in a
reflected by Nebraska government debt,
conscientious resolve against debt,
restrictive taxes and regulatory legis-

In behalf of all citizens, I invite industry to share Nebraska's unique heritage as the continental crossroads of lation. commerce and heart of a land unmatched in natural wealth.





Val Peterson

\* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

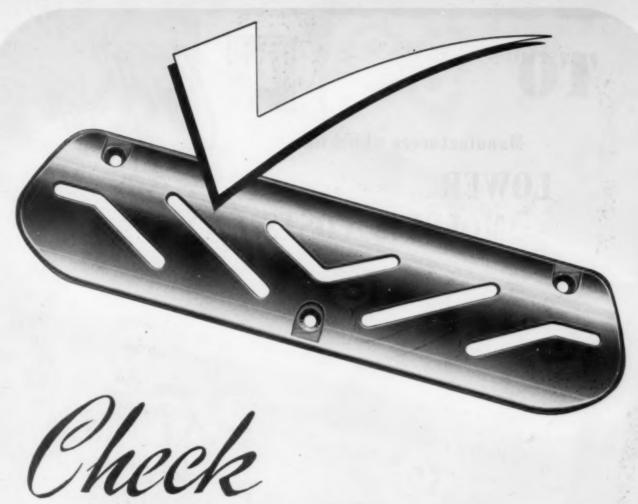
Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

\*Address Industrial Department, Union Pacific Railroad Omaha 2, Nebraska

UNION PACIFIC RAILROAD

Road of the Daily Streamliners

60



## ON INJECTION MOLDING, TOO

The injection molded example above is not as simple as it looks. It required use of a difficult material, freedom from warp or shrinkage, accurate gate trimming, minimum weld lines, close tolerances and high mold finish—the kind of exacting job Yardley likes.

Yardley's reputation as extruders continues to grow. No wonder, since Yardley developed so many new techniques and improved methods.

But Yardley also does a big volume in injection molding in capacities up to 16 ounces.

The same experienced engineering personnel — skilled designing service — tool and die facilities and close inspection are yours at Yardley whether it's extrusion or injection molding.

And the same widespread organization serves you promptly, intelligently, completely. Tell us your problem.



ARDLEY PLASTICS CO.

142 PARSONS AVE. . ADams 9315 . COLUMBUS 15, OHIO

TO



Manufacturers who'd like

## LOWER **MOLDING COSTS**

an open

We'd be crazy if we guaranteed to underbid any other molder, although our customers say we often do. Better than that, we at Norton can guarantee you some things which usually add up to definite and

For one, technical cooperation. The Norton engineer. substantial savings. ing staff is highly respected for sound ideas on plastics design, color, materials...matters that seriously effect the service your product will give and often its sala-

Also, heavy experience. Twenty-five years of precision bility too.

molding for customers whose name everybody knows. Large and small pieces...long and short runs...on

compression and injection presses.

Let us show you, on your own jobs, how Norton service adds up to lower costs. Just send us a model, sketch or blue print.

CHICAGO -9 South Clinton St.

Sales Office: NEW YORK CITY - 347 Fifth Ave.



no fire hazard here....

SANTICIZER 141

MONSANTO'S NEW FLAME-RETARDANT PLASTICIZER

By incorporating Santicizer 141 in polyvinyl chloride films you can achieve exceptional flame-retardant qualities without sacrificing flexibility or drape. This superiority is proved by a comparison of burning rates — Santicizer 141 flames out in 1 second flat, while other equally efficient plasticizers have a minimum burning rate of 38 seconds.

In addition to this vital safety factor, Santicizer 141 has many other advantages as a plasticizer for vinyl compositions used in curtains, upholstery materials, tablecloths, floor tiling, wearing apparel and a wide variety of similar products:

Low toxicity • High compatibility with vinyl resins • Low volatility • Softness and drape • Resistance to weathering • Strength, elasticity, abrasion resistance • Good low-temperature flexibility.

Since Santicizer 141 will soon be available in commercial quantities, send now for samples, application and technical data. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1708 South Second Street, St. Louis 4, Missouri.

\*\*Banticizer: Reg. U. S. Pat. Off-Chemicals Division of Chemicals Division of C

MONSANTO CHEMICAL COMPANY MPO-11
Organic Chemicals Division
1708 South Second Street, St. Louis 4, Missouri
Please send me latest data on Santicizer 141 for.

SERVING INDUSTRY . . . WHICH SERVES MANKIND

COMPARATIVE "FLAME-OUT" TIME

Santicizer 141 vs. two similar plasticizers

Santicizer 141 . . . 1 Second

Secretary of the Control of the Cont

Pletteler I H Street





#### **FLYING DUCTS**

### ... molded of Fiberglas\*-reinforced plastics

275 air ducts (196 different sizes and shapes) are used in building the famous Boeing Stratocruiser. For these intricate molding operations, Boeing engineers found that Fiberglas-reinforced plastics offered a threefold advantage over metal. Complicated shapes could be made in quantity production at less cost; the ducts could be shaped without the restrictions of metal; they represented a weight saving as high as 40%.

Fiberglas reinforcements are helping many designers and manufacturers produce laminated plastics products that are:

- · Light in weight and extremely tough.
- · Resistant to corrosion and rust.

- Permanently colored: Eliminates original cost of surface finishing—no maintenance cost.
- Easy to fabricate: Can be formed with either highor low-pressure laminating equipment—at minimum tooling cost.
- Economical: Fiberglas reinforcements are available, today, priced lower than most commonly used laminating reinforcing materials.

For information on the properties, applications, economics and typical methods of fabricating products of plastics reinforced with Fiberglas Mats, Fibers and cloths woven of Fiberglas Yarns—write for a copy of the Fiberglas-reinforced plastics manual A9.3.1. Owens-Corning Fiberglas Corporation, Dept. 876, Toledo 1, Ohio. Branches from coast to coast.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

Photo: Courtesy of Boeing Airplane Company, designers and builders of the Boeing Stratocruiser, C-97 Stratofreighter, B-50 and B-29 Superfortresses and the B-17 Flying Fortress.

FIBERGLAS

PLASTICS REINFORCEMENTS

\* FIBEROLAS is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with glass fibers.

# ANOTHER PLUS FOR ELMES PRESSES

Elmes molding presses are even faster, now that the lower knockout resets merely by pressing a button! This Elmes "first" is a valuable aid to high-speed operation. It's safe, and saves time—gives Elmes users another plus in profits.

In appearance and action these versatile presses are modern tools of production. Note the compact arrangement with integral power, convenient push-button panel, and free access front and back. Yet extra-large die space adapts standard presses for virtually all job requirements.

Automatic position slow-down protects molds at closing. A locked-in timer discourages unauthorized changing. Capacities from 100 tons, with accessories optional. Investigate these money-makers now.

#### ★ GET THIS FREE BOOK

12-page booklet, "Elmes Hydraulic Equipment for the Plastics Industry," is packed with useful information on compression and transfer molding presses, Elmes Hydrolairs with the new "Power-petuator," hobbing presses, lab. presses, high-pressure pumps, and Elmes accumulator systems. Please ask for Bulletin 5200-A.



### ENGINEERED BY ELMES

Good Hydraulic Production Equipment Since 1851

ELMES ENGINEERING WORKS of AMERICAN STEEL FOUNDRIES, 225 N. Morgan St., Chicago 7, Ill.

Distributors in Principal Industrial Centers . Also Manufactured in Canada

METAL-WORKING PRESSES - PLASTIC-MOLDING PRESSES - EXTRUSION PRESSES - PUMPS - ACCUMULATORS - VALVES - ACCESSORIES

## The "HOT SPOT" of the demonstration of



## THE BOILING WATER TEST.

Products made of Koppers Polystyrene P-8 retained their shape after 30 minutes of boiling which is considerably longer than they would stay in the automatic home dishustant. This extra heat resistance you get without extra cost. Why not use Koppers Polystyrene P-8 and give your customers a better product for their money.

## Plastics show was the

# KOPPERS HEAT-RESISTANT POLYSTYRENE P-8

THERE were plenty of interesting exhibits at the Plastics Show in New York, but people really got excited at the Koppers display. Here they saw the boiling test of the new Heat-Resistant Polystyrene P-8. Tea strainers made of P-8 were immersed in boiling water for 30 minutes—a test that would twist ordinary polystyrene out of shape—but there was no material distortion of the strainers made of Koppers P-8.

What really makes this "Hot News" to the plastics industry is that Koppers Heat-Resistant Polystyrene P-8 sells at the same price as regular polystyrene which is the lowest in cost of all the thermoplastics!

Molders and plastic buyers were quick to see that here was the material their customers wanted. No longer would they have to pay a premium for heatresistant plastics. Tea strainers, funnels, measuring cups, cutlery handles, canisters, nested cups, refrigerator dishes and a host of other products—could now be made to stand the heat of the automatic home dishwasher. Radio cabinets would not distort over the hot spot of the power tube. Lighting fixtures made of P-8 would keep their shape.

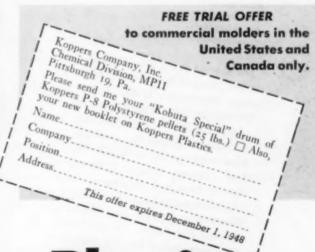
But this is not the complete story of Koppers amazing new Polystyrene P-8. A faster molding cycle and better moldability mean lower costs and greater production.

No extra price. Remember, Koppers Polystyrene, P-8 gives you all these advantages at no increase in price. This is possible because a radically different manufacturing process, pioneered by Koppers, permits rigid quality control from the raw chemicals to finished P-8. Send the coupon for free sample and the new booklet on Koppers Plastics.

KOPPERS COMPANY, INC.
Chemical Division Pittsburgh 19, Pa.



Suborb clarity or any color you want. Koppers Color Chips each carry their own identification number. Once you choose a color it can be duplicated order after order with scientific accuracy.





**Koppers Plastics** 

\*POLYSTYRENE

\*CELLULOSE ACETATE

\*ETHYL CELLULOSE



## THE CARVER LABORATORY PRESS

## Standard for Research and Development

## CLP's in Plastics Laboratories

SOME OF THE

Testing single-cavity molds. Molding color samples Production of samples. Plastics instruction and demonstration. Metallographic mounting. Metal insert mold tests. Vulcanizing. Drawing. forming. Embossing. Bonding plywood. Testing tensile properties. Testing compressive properties. Testing shear strength. flow tests. Crushing tests. Breaking tests. Determining heat cycles.

The Carver Press provides complete range of temperatures from room temperature to 400° F. Adjustable by thermoswitch to within plus or minus 2° F. Equipped with accurate 6" gauge that provides load readings up to 20,000 lbs. Low pressure gauges optional. Carver Standard Accessories include Electric or Steam Hot Plates; Electrically Heated and Water Cooled Hot Plates; Carver Test Cylinders; Swivel Bearing plates; Cage Equipment, etc.

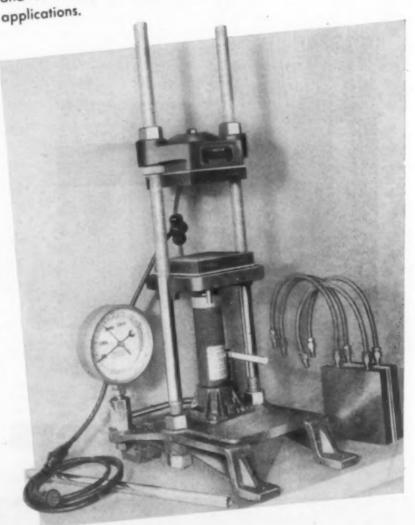
FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
343 HUDSON ST. NEW YORK 14, N. Y.

Recognized as standard for plastics research and development, the Carver Laboratory Press is used throughout the world. "One of the most useful pieces of equipment any laboratory can have." In these words a user sums up the variety of services performed by the Carver Press.

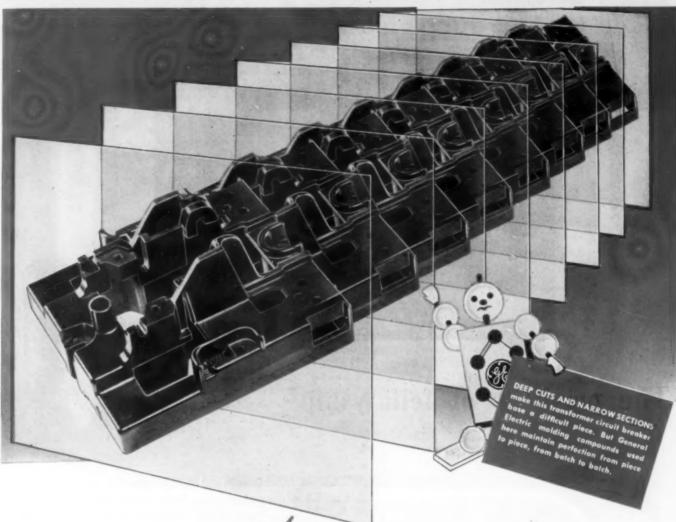
Carver Press.

If you have a laboratory, small or large, you have many potential uses for this Press. One of its money saving features is the range of Carver Standard Accessories available as optional equipment.

Send today for latest Catalog. It illustrates the Press and accessories and describes some of the general applications.



## DEPEND ON G-E MOLDING COMPOUNDS



# for your complex molding jobs!

You can keep on turning out complex shapes at a profit when your mold is right—and when your powder is right. You'll find it pays to depend on General Electric molding compounds to be sure of constant physical properties plus consistent molding behavior.

#### Quality Control Gives You Uniformity

You keep getting the same characteristics from blend to blend of any G-E molding compound. That's because each batch is checked by famous G-E quality control methods for flow . . . tensile strength . . . impact strength ... dielectric strength ... apparent density ... shrinkage ... bulk factor ... and other critical properties to keep your production flowing smoothly.

#### Complete List of Materials Gives You a Wide Choice

You'll find many standard G-E molding powders . . . phenolic or modified-phenolic resins . . . wood flour, cotton flock, rag, or asbestos fillers . . . in colors or mottled effects. You can also have a special formula custom-tailored to your exact requirements.

#### Application Engineers Give You Technical Help

G-E engineers are ready to give you the benefit of their experience. And G-E laboratory facilities are available to help solve your molding problems. Ask to see comprehensive data sheets for every G-E compound. Just drop a line to Section DX-11, Compound Division, Chemical Department, General Electric Company, Pittsfield, Mass.

GENERAL ELECTRIC

### **Tupperware**

Winner, among thousands of contestants, of the single award panible to bestow . . . done a mantle of leadership



### The privilege of fellowship

NESTING CUP CAP MADE BY TUPPER — PART OF A "THERMOS BRAND VA-CUUM BOTTLE".



When a typical member of the fellowship of responsible American Industry such as American Thermos Bottle Company, extends its hand . . . making our product an essential part of theirs, we are gratified, of course. And feel, with all due modesty that we are privileged to confidently bespeak the association of our own with other fine products. There is a language spoken and understood by, and between men who have experienced like experiences; experiences that set them apart from other men; that bring them together in a common bond of fellowship.

This language employs the identical words uttered by other men, but, when passed within the fellowship, makes articulate certain special codes of behavior and principles of practice in their dealings with each other and with their fellow men.

There is a fellowship within American Industries. In each there are units that "belong". It is a very great privilege to be one of this fellowship and one that we, as custom molders within this new, lusty, striving industry of ours, cherish highly. To those others within the fellowship we address our respects and present the thought that an association of our products with theirs will sustain and maintain those principles to which we each subscribe.



### TUPPER CORPORATION

FACTORIES: Farnumsville, Mass., and Cuero, Texas

New York Show Rooms 225 Fifth Ave.

ADDRESS ALL COMMUNICATIONS TO: Development Department D, CUERO, TEXAS

# ASK

# How Automatic?

THE term is often loosely used to describe a machine with some automatic feature. It may be an Automatic Injection Press, an Automatic Screw-machine, or some operative or control device. Such expressions often lead to illusory hopes of savings in labor cost.

When Stokes says "Automatic Molding Press" or "Fully Automatic Molding Press" the expression describes a Molding Press so completely automatic as only to need material fed into the hopper and removed in processed form from the receiver.

Stokes Automatic Molding Presses are truly and fully automatic, for they will run 24 hours a day with only one operator for as many as a score of automatic presses. Even your night watchman can run a

battery of these truly automatic machines.

Stokes makes many such presses, in many sizes, for the fully automatic production of plastic parts (including threaded closures) to save labor and material, reduce inventory, minimize rejects.

Should you wish to consider automatic plastics molding, send samples or drawings to Stokes for a production analysis and equipment recommendations. Before you invest, you will get the facts, backed by experience of the only manufacturer of completely automatic plastics molding presses. When you buy Stokes Automatic Presses, you just "Feed 'em and Reap". F. J. Stokes Machine Company, 5934 Tabor Road, Philadelphia 20, Pennsylvania.

Stokes makes Semi-Automatic and Automatic Molding Presses, Plunger Presses, Closure Presses, Preforming Presses, Industrial Tabletting and Powder Metal Presses, Vacuum and Special Processing equipment, Water Stills and Special Machinery.

Battery of 19 fully automatic 15-ton Stokes molding presses . . . run by one operator . . . or night watchman in custom molding plant.



STOKES KNOWS

# ASK this Plastic Molding Press

His is the Stokes fully automatic Model 235. To be sure, you need a man to feed it, but he can feed a whole battery of 'em.

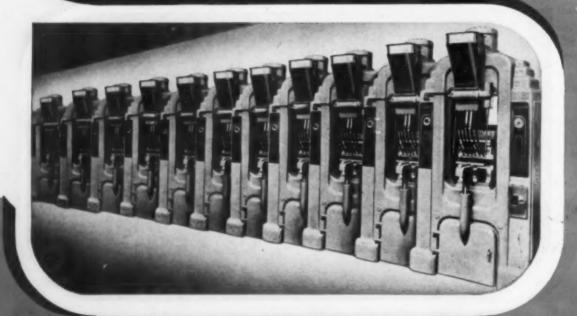
Fully automatic cycling gives more production per cavity, requires fewer mold-cavities. Therefore molds cost less and are more quickly readied for production. Thus, every second counts for production, as Model 235 runs on for 24 hours a day. Material savings are often as high as 10% . . . production as high as 70,000 pieces per week, with rejects at a minimum.

If automatic molding is the answer to your problem, the Stokes Model 235 is a key to your answer. In any case there is a Stokes Plastic Molding Press for the needs of every maker of plastic parts. Stokes makes a *complete* line of Plastic Molding presses . . . gives *complete* advisory service on every phase of molding procedure. Write F. J. Stokes Machine Company, 5934 Tabor Road, Philadelphia 20, Penna.

Stokes also makes Semi-Automatic Plastic Molding Presses, Preforming Presses, Plunger Presses, Powder Metal and Ceramic Presses, Vacuum Pumps

and Gages, High Vacuum Processing Equipment and many Special Machines.





STOKES KINDWS

#### PLAXPAK FILM KEEPS RUBBER FRESH



Armstrong Rubber Company is using Plax polyethylene film (Plaxpak) to package and protect its camelback tire retread rolls and new whitewall tires. Result: more efficient packaging at reduced cost, particularly with camel-back.

Plaxpak film is used as an envelope for each roll of camel-back and as continuous backing between the layers. The backing peels cleanly, leaves no flakes for retreaders to pick off, and prevents adhesion within the roll. Because of its extremely low moisture-transmission rate, the Plaxpak envelope keeps the camel-back tacky, just right for use.

Plaxpak film comes slit to size and as seamless "Layflat" tubing. Please write for details.



P. O. BOX 1019 \* HARTFORD 1, CONNECTICUT In Canada — Canadian Industries, Ltd., Montreal



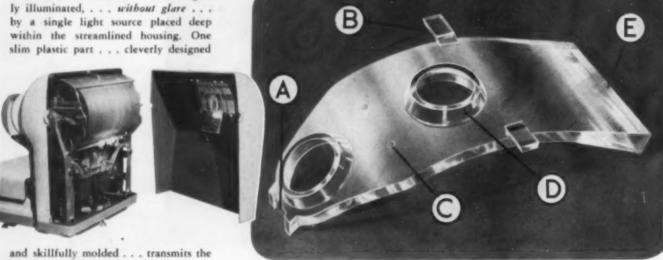
The weight indicator of this new Toledo

Scale is easily read without exterior lighting of any kind . . . thanks to the

unusual optical properties of a certain group of plastic materials. Both the indicator and Toledo trademark are brightIN THE NEW TOLEDO GUARDIAN SCALE . . .

# a Plastic Light Track

AND TOLEDO TRADE MARK



and skillfully molded . . . transmits the light from this concealed source up to where it's used. The result is a more compact design than could be achieved with conventional lighting.

The myriad properties of the scores of available plastics are known to the plastics expert. It is advisable to submit your product or plans to him for refinement. Here at Aico our 32 years of experience... molding all plastics by all methods ... enables us to offer unbiased recommendations for improving your product by the use of plastics properly applied.



An acrylic resin was selected for this light track because of its 'ability to "pipe" light by a high degree of internal reflection. A mirror-finished mold in an injection press rapidly produces the tracks, ready for installation after removal of flash. Assembly in the scale is facilitated by the accurately bevelled seat (A) and studs (B). Mounting screws are positioned by holes (C) which are molded in. The sides of the wells (D) surrounding the areas to be lighted are molded at the exact angles best for this purpose. Light is applied at the end (E) which is of greater thickness for better light pick-up and distribution.

Write today for the Aico Portfolio of plastics applications. It contains 28 actual instances of products made better with Aico molded plastics.



AMERICAN INSULATOR CORPORATION
New Freedom, Pennsylvania

MANY THINGS ARE BETTER BECAUSE OF PLASTICS



#### HERE are over two million retail outlets in the United States today, including, of course, service stations, repair shops, restaurants, bars, and theaters. There is a consumer outlet for goods or services for every 71 persons. The outlets for goods all use displays. either purchased as standard fixtures or obtained from the makers of the goods sold.

The name "display" is here used to mean a device that presents actual merchandise, as differing from a "sign" that presents only a picture, name, trademark, or message. A display may or may not include a sign.

How much plastics are used in store displays is anybody's guess - and so broad is the field that the amount is probably even greater than the wildest guess. Applications of plastics to displays are increasing daily. The reasons for this are bound up in a new conception of sales technique at retail.

Experts in retailing call this technique "free-flow

# SELLING WITH PLASTICS DISPLAYS

merchandising." It is based, primarily, on two main factors in the cost of distribution: the expense of sales-floor space and the cost, per unit of sale, of a sales person's time.

The big ideas behind all post-war store architecture are to have all items displayed in sales areas up for sale, to have all replacement stocks and services hidden in convenient but less expensive locations such as

"skin" of the store, to have no crossing of merchandise traffic and customer traffic, to have as much self-service as possible, to have a minimum of barriers between goods and customers.

All this means that merchandise displays must be subordinated to the merchandise. They must be unobtrusive as furnishings except where they perform a service function. They must be light in weight and portable because the modern store requires sales area flexibility. They must, if comprising signs, present their message quickly and forcefully. When

1 - Story told at a glance

2 - Product can be seen from all sides







3 — Display symbolizes sales message

provided by a manufacturer of goods as part of a "deal" to help the retailer move the line, they must be beautiful enough and durable enough to encourage their long use; when bought as fixtures by the retailer they must be versatile, durable, and easy to maintain.

According to display men there is no such thing as plain product presentation. Every display unit has one or more of the following duties to perform: to glamorize; to protect while making visible; to show details through cross-section or action exposition; to permit selection of sizes, colors, and textures; to illustrate a number of uses or properties; to actually sell through self-service appeal.

For purposes of simplification, plastics displays may be put into eight main classifications, although each display is likely to have features applicable to more than one of these groups.

They are as follows: 1) product glamorization displays; 2) detail or mechanical exposition displays; 3) cosmetic displays — a field with laws unto itself and one in which plastics are paramount; 4) displays for selection of size or color; 5) self-service dispensers — frequently combined with selection; 6) display fixtures or furniture; 7) special displays such as refrigeration selling units; 8) architectural installations in which the plastics are used decoratively or structurally as well as functionally in displaying goods.

Selected examples of displays which illustrate these main classifications, with variations, are presented in the accompanying photographs and described in the following paragraphs.

#### **Product presentation**

Decorative knitted "socks" used to keep highball glasses dry on the bottom and more comfortable to



5 — No explanation needed with acrylic model



6 and 6A — Circular sign (left) reverses to reveal mirror (above) for demonstrating use





4 and 4A - Molded fingers scratch plane's back, supply motion so necessary for sales

handle are not too easy to display no matter how well packaged. Fig. 1 shows how Classic Studio, New York, N. Y., fabricated acrylic material into a display which shows Hi-Jacs in use and in the complete color range. The story is told at a glance, which is one reason why this simple display increased sales over 300 percent.

When RCA Victor introduced its rather expensive Solitaire Personal Radio (which itself is made of plastic with 14-K gold plate) the display problem was one of showing the product simply and against a glamorous background. Fig. 2 shows the display designed by W. L. Stensgaard & Associates, Inc., Chicago, Ill. The floor of the display itself is wood covered with glass fabric; the case, showing the product from all sides, is fabricated from Plexiglas; the base and frame are made of laminated wood.

Seasonal sales of many items such as liquor and cologne bring the need for dramatic treatment by the use of unique materials. The Prince Matchabelli cologne display in Fig. 3 has a base of foam polystyrene fabricated by Arts & Flower Display, New York, N. Y. The elements of the display are coordinated to symbolize the sales message.

#### Details of product use and construction

The Miller Mfg. Co., Ottoville, Ohio, put on the market recently a small injection-molded acetate toy plane, the propeller of which can be made to rotate in either direction by simply scratching the finger along either side of the fuselage. The company was faced with a problem that the toy had to be seen in operation to appeal. When a sales girl demonstrated it, it sold: when left on counters, even with explanatory signs, sales fell off.

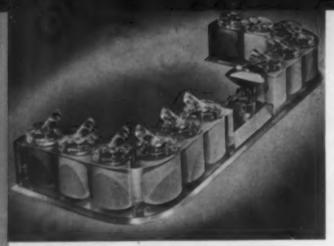
So Miller decided on the mechanical demonstrator shown in Figs. 4 and 4A. An impression of a pair of woman's hands was made in dental wax and a plaster positive then formed from the wax negative. From this plaster positive was made the Nupamold

7 — Formed preprinted sheets carry message and sample



8 — Accessibility plus protection





9 — Miniature powder plant for custom blending



10 - Immediate product identification and style choice

11 — Differences readily seen

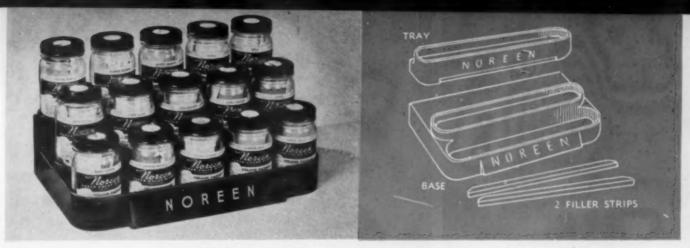


which was used by Atlas Plastics Inc., Buffalo, N. Y., in which to cast the plastic hands. The hands were made from Durez cast phenolic in the flexible molds. Each hand is a single piece except for one thumb which was molded separately. The molded hands were painted and mounted on the mechanism which extended through the demonstrator box. The lower hand clasps the toy plane tightly by the separately molded thumb attached by a pinned spring. The upper hand has a steel insert between two of the fingers. The mechanism in the box causes the lower thumb to turn the model plane; the metal piece between the upper fingers scratches the plane's back, causing the propeller to spin in either direction, according to the plane's position. The resulting "action" display has proved to be a powerful sales aid because of its realistic presentation of the operation of the product.

Where an intricate mechanism must be explained to very critical customers, a transparent plastic replica makes an effective display. To model airplane enthusiasts the acrylic scale model gasoline engine shown in Fig. 5 needs no words nor literature in sales support. It was fabricated by Transpari-Parts, New York, N. Y.

Figs. 6 and 6A show a new demonstrator display molded by Shaw Insulator Co., Irvington, N. J., for the Sunbeam Shavemaster. Relatively simple in design, the display base is made of gray Plaskon urea to match the razor case. For demonstrating use, the plated steel bracket, which in display rests around the dome of the base, swings upward and the circular sign reverses to reveal a mirror. To discourage unnecessary handling and to keep the item clean, an acrylic dome is fitted over the guard pad holding the razor. This job was compression molded on a 14-in. press and Shaw used a center preform plus a two-step mold closing technique to secure fast flow of the gray material.

The biggest recent news in the display field is the development by Stanley Wessel & Co., Chicago, Ill., in cooperation with Borkland Laboratories, Marion, Ind., of the Triographic process of pre-printing vinyl and other thermoplastic sheets in multiple colors and then forming the printed sheet into displays and signs having complex contours. Until now, in producing three-dimensional effects, it has been necessary to form first and then decorate by spray painting, hand coloring, or decalcomania. With this new process, accurate register of the printed section on the forming dies is assured and full-color offset or letter press printing may be used, resulting in quantity runs of the displays with the beauty of magazine advertising plus marked economy. Stanley Wessel, originator of the process, is pointing out in Fig. 7 the striking bas-relief obtained in quantity displays developed for the Ronson Art Metal Works, Inc. It will be noted that each display is fabricated to feature one or more actual Ronson lighters. The



12 — Versatile display stand (parts at right) is adaptable to meet beauty parlor needs

displays are washable, scratch-proof, and non-flammable.

#### Multiple factors in cosmetic displays

The cosmetic industry is one of the largest users of displays and the problems are so diverse that the rules for displays change with each new job. Fig. 8 shows a Bourjois "Evening in Paris" lipstick display designed by Troeger-Phillips Inc. in collaboration with Stanley Sapery Co., New York, N. Y. The cover is formed of Plexiglas by Plastic Artisans, Inc., White Plains, N. Y., which also assembles the base which is molded of polystyrene by Harry Jamieson, Freeport, L. I., N. Y. The frame and stem of this "dial" revolving lipstick display are of aluminum.

Another example of the use of plastics for varied and unusual display purposes in the cosmetics field is shown in Fig. 9. This is a powder counter display and sales unit for Charles of the Ritz, fabricated from Plexiglas by Steiner Mfg. Co., Long Island City, N. Y. The main element in the display is the series of powder wells, drilled with smooth surface interiors into two L-shaped blocks of 4-in. thick acrylic material. The covers for these wells are latheturned with a concentric ring pattern which breaks up the light, and these covers have cylindrical plastic handles. Alignment of handles when covers are replaced is assured by keyways cut into the tops of the powder wells. With the scale in the center of the

display, this unit becomes a miniature plant for custom blending of face powders to customers' personal specifications.

#### Style and color selection displays

Where more than one product or more than one style of a single product is to be displayed to permit straight selection or to promote sales in sizes, styles, or colors, plastics have been used to good effect. Generally these displays are in the nature of housings, which contain merchandise similar to that displayed.

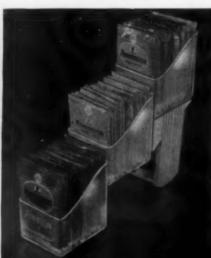
Pro-phy-lac-tic Brush Co., Florence, Mass., designed and produced the display shown in Fig. 10 to promote the sale of its own Jewelite comb. Five acrylic combs are displayed on the front of the molded stock cabinet which stands 10¼ in. high and which is made economically from reground colored acrylic. The name sign, which fits into slots in the brackets on top of the display, is molded from clear virgin acrylic material, as are the combs.

Becton Dickinson & Co., Inc., Rutherford, N. J., had a problem in displaying three types of household fever thermometers together. Lumarith cellulose acetate in molded and in extruded form and as transparent film was the material answer to the problem. The cabinet shown in Fig. 11 is a one-piece injection molding in white material by Maurice Gagnon, Pawtucket, R. I. The message on top of

13 — Quantity, self-service, visual display



14 — Easy to reach



15 — Refilling is simple COURTESY TENNESSEE EASTMAN CORP.







COURTEST MODERN PACKAGING

16 — Triple choice 17 — Maximum display of parts with size, type, and quantity indicated

the display is printed on card with a Lumarith film surface lamination by Hopp Press Inc., New York, N. Y. Hopp also extrudes the interior thermometer racks. The display is manufactured by Graham Products, Inc., Springfield, N. J.

Beauty Products, Ltd., Denver, Col., had a merchandising problem-child in its Noreen hair rinses, of which 15 types are put up in two package sizes. The product is used or dispensed by beauty parlor operators and the distributor had to be given a display device which would permit making up different sales units for various sizes of beauty parlors.

The problem was overcome by the use of the display shown in Fig. 12 and its accompanying drawing. A base, a tray, and two filler strips (to make up for the difference in height between the two different sizes of packages) were molded from Bakelite general purpose phenolic by Yorker & Sons, Denver, Col. Five different displays may be produced from these four pieces.

#### Self-service merchandisers

In modern variety stores, in notion shops, and frequently in drug stores, the principle of self-service to cut sales costs has long been established. The store provides open top display tables in many cases, but frequently it is to the advantage of the product manufacturer to provide self-service display and selection units, termed "merchandisers" by the trade. Here the trend is toward volume orders on the displays and therefore toward large molded units rather than to more expensive acrylic fabrications.

Curtiss Candy Co., Chicago, Ill., wanted an attractive display for its fruit drops and gum which would provide point of sale advertising, would give visual display of the merchandise, would carry a sufficient quantity of candy and gum to merit the investment, and would foster self-service.

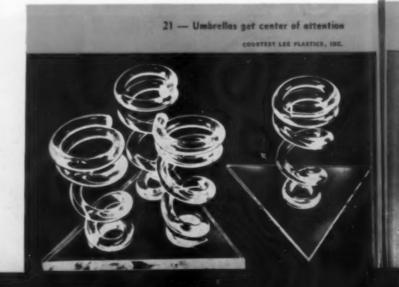
The display shown in Fig. 13 is injection molded of polystyrene by Plastics Mfg. Co., Dallas, Texas.

It involves the use of two-way side panels, center core, clear polystyrene separators, and two aluminum assembly units. The molder not only produced the molds for the job but also set up special jigs to assemble the cases in its plant.

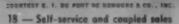
Self-service is also the purpose of the Admiration pocket handkerchief display shown in Fig. 14. The piece is the result of collaboration between Stanley Sapery Co., New York, N. Y., and the Cowan-Boyden Corp., Chartley, Mass. It consists of three clear polystyrene boxes fitted together with a metal stand which has been sprayed with aluminum. The front box is hot stamped in gold letters.

A display stand and dispenser for individually wrapped Alka-Seltzer tablets is shown in Fig. 15. The entire stand is molded of clear Tenite II cellulose acetate butyrate by Modern Plastics Corp., Benton Harbor, Mich. Letters of the trade-name are etched on the underside and filled with a white paint prior to lacquering the inside of the base in a blue which carries out the color scheme of the Alka-Seltzer carton. Tablets feed out through a front opening corresponding to the opening in the bottom of the carton.

Three different sizes of triangular bottles of Pepto-Bismol, made by Norwich Pharmacal Co., are dis-









19 — Counter top salesman



20 - Easily removed

played to good effect on a molded polystyrene stand, Fig. 16, produced by Celluplastic Corp., Newark, N. J. This display was designed by Benedict & Moore, Inc., and, being a one piece job with large area, required careful mold design for maximum material flow.

The display shown in Fig. 17 made history this year. Stock drawers molded from polystyrene by Bernard Edward Co., Chicago, Ill., for E. Edelmann & Co., Chicago, contain plain sealed polyethylene envelopes, each of which holds a supply of Edelmann's standard small replacement brass fittings, screws, etc., used in the automotive trade. Edelmann fabricates the envelopes from polyethylene tubing with a yellowish cast which gives maximum display to the brass parts. Inside each envelope is a printed tag identifying the type and size of the fitting and the quantity in the package. Inside the front of each display box is a card carrying the brand name and identifying the items in that particular drawer. The whole unit may be used in a stock cabinet or for counter display.

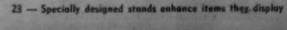
Self-service plus coupled sales of flashlights and batteries plus brand identity in counter display is offered by the fabricated Lucite merchandiser for Bright Star Battery Co., Clifton, N. J., Fig. 18. Counter-top sales of Murine eye drops are promoted by the molded white Lustron merchandiser shown in Fig. 19. The unit measures 7½ in. high, by 8½ in. wide by 5½ in. deep and holds a half dozen packages of Murine in each of two sizes. Lettering and price marking are screened on the case in black and red and special anti-static solution coats the whole display. The piece is the product of G. Felsenthal & Sons, Inc., Chicago, Ill.

Dutch Brand friction tape made by Van Cleefe Bros., Chicago, Ill., is displayed in a self-service dispenser molded from polystyrene by Plastic Industries, Inc., Kent, Ohio, and assembled by Milton Sturm & Co., Chicago. This dispenser, shown in Fig. 20, keeps the individual boxes visible yet permits the customer to remove them easily.

#### Display fixtures or furniture

Standard equipment in all stores merchandising apparel of any kind and some stores selling other things such as bakery goods, etc. is the display fixture. With the advent of "free flow" retailing, there came an increased use of glass in these fixtures and less use of wood. Now, glass is being rapidly replaced by acrylic because the modern display fixture has to be flexible and portable. There are several stand-











COMBTEST BOND & HAAS CO.

24 - Trays removable but lids stay put

ard lines of acrylic display fixtures for the men's wear, women's wear, and shoe trades; and these are largely bought by the stores themselves.

There are also many instances in which a manufacturer of branded goods provides sales fixtures marked with his own trade-mark to assure himself that his goods will be properly displayed.

Standard lines of plastic display equipment such as is purchased by stores include the one- and three-way umbrella merchandisers produced by Lee Plastics Inc., Philadelphia, Pa., (Fig. 21); the counter rack by Lustra-Cite Industries, Inc., New York, N. Y. (Fig. 22); the stands and racks by Scheuer Creations Inc., New York, N. Y. (Fig. 23); and the tray and counter combination by Merchandise Presentation, Inc., New York, N. Y. (Fig. 24). All of these representative display units are fabricated of acrylic,

Based on acrylic trays 10 in. wide, 15 in. long, and 3½ in. deep, the unit shown in Fig. 24 is making great headway in stores selling lingerie, men's shirts,

children's wear, and other folded apparel. The set is so designed that the plastic covers can be left in the showcase when the trays are removed. And the trays may be built into dozens of different unit groups including architectural units.

#### Refrigerated and special displays

Special displays featuring the use of plastics are exemplified by the one in Fig. 25. This refrigerated candy case, built by Guiberson Co., and distributed by Wahlstrom Industries, has its Plexiglas components fabricated by Dallas Plastics Co. All these companies are in Dallas, Texas. The King Candy Co., Fort Worth, Texas, has 20 initial units now under test in the field.

#### **Architectural installations**

The transition from the development of standard display equipment or sales fixtures to the architectural application of plastics for display purposes was only a short step. The acrylics are most important here because of their optical properties and light weight. Fig. 26 shows an installation in the world's largest drug store — the Rexall Store in Los Angeles, Calif. The counter top display cases made of Plexiglas by Campbell Industries, Los Angeles, are so designed that they may be moved about. The light trough on the wall in the background is also acrylic.

Whenever competition increases, manufacturers go after new business with new displays. As self-service broadens in scope to embrace more and more lines of merchandise, there will be more effective and more functional displays. As stores throughout the United States undergo refurbishing and redecorating, and as many new stores are built, more and more attention will be given to displays of all kinds.

How many of these displays will be made of plastics is still another guess. But the guess had better be high, because plastics have proved themselves in this field.

25 - On ice . . . with point of sales advertising

26 — Architectural applications are enhanced by properties of acrylic





OTOS COURTEST ROHM & HAAS CO



Part of the gathering at the Competition award luncheon. Publisher Breskin is at the microphone at the speakers' table

## **Award of Competition Trophies**

ORMAL presentation of trophies to winners in the Seventh Modern Plastics Competition was made at a luncheon held at the Plaza Hotel, New York City, September 29, attended by some 450 representatives of industry, commerce, and the press.

In preliminary remarks reviewing the significance of the Competition, Modern Plastic's publisher, Charles A. Breskin, placed emphasis on the enthusiasm and imagination of the plastics industry, so obviously reflected in the broad range of products which were entered.

Alfred Auerbach, sales engineer and senior judge in the Seventh Competition, speaking for the judges, laid stress on the excellence of the 1300 entries and the difficulties which beset the paths of the judges in reaching their final decisions, despite the many categories into which these entries were divided.

Representing the award winners, Charles J. Romieux, American Cyanamid Co., spoke briefly for those producers of plastics products whose entries in the Competition helped to make it such a successful promotion effort for the industry as a whole.

On behalf of participants in the Competition and as a tribute to Mr. Breskin's contributions to the furtherance of the industry's interests, a silver tray was presented to him by Mark Steiner, Steiner Mfg.

The luncheon program was concluded by Hiram McCann, Editor of Modern Plastics, who presented individual trophies to executives of companies which won awards. Details of winning entries were published in the September Modern Plastics.

Representatives of award-winning companies, with the trophies presented by Editor McCann (extreme right)





#### MEET THE

#### HIRAM McCANN

Our new editor came to Modern Plastics as Eastern Editor in 1945 and was appointed Associate Publisher the following year. His publishing career started in 1924 when, at the age of 16, he went to work as a cub reporter on an Ontario, Canada, newspaper. After graduation from McMaster University in 1929, Mr. McCann specialized in trade and industrial publishing. To the Editorship of Modern Plastics he brings a concentrated knowledge of publishing operations, distilled from years of enthusiastic work, study, and observation.



R. L. VAN BOSKIRK Senior Editor

Dr. Gordon M. Kline Technical Editor



A. PAUL PECK Managing Editor

VAL WRIGHT Midwestern Editor





#### EDITORIAL STAFF

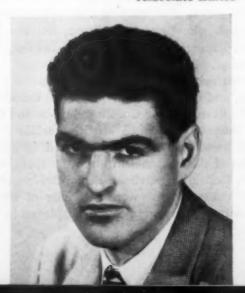
It is with pleasure that we announce the appointment of Hiram McCann to the Editorship of Modern Plastics Magazine, and the promotion of R. L. Van Boskirk from Features Editor to Senior Editor, effective with the present issue. With this announcement, it seems particularly appropriate to introduce the other members of the editorial staff to our readers. Charles A. Breskin, formerly Editor and Publisher, remains as Publisher and assumes the duties of Editor-in-Chief.





FRED B. STANLEY Engineering Editor

WARREN H. GOODMAN Associate Editor





THEODORE B. BRESKIN Assistant Editor



DONALD R. RUTHER Art Director



VIRGINIA SUE WILSON Associate Editor



LINDA T. LEFLER Assistant Editor



EMMA TURAK Readers Service

# Seen at the N.T.E.

ORE than 39,000 representatives of trade and industry attended the Third National Plastics Exposition in Grand Central Palace in New York September 27—October 1. The 133 exhibitors took 196 booths. The plastics industry, which will produce and process approximately three times the poundage in 1948 that it did in 1939, showed continuing progress in improvement of resin properties, in breadth of application, in versatility, and in upping of quality at all levels.

Reports from Modern Plastic's editorial team surveying the Exposition showed that interest ran high. From these reports were prepared the following paragraphs which briefly present the highlights of recent developments as shown at the Exposition and, in many cases, indicate important trends.

#### FOUR NEW POLYSTYRENES

From a raw materials standpoint, probably the most dramatic development was the announcement of four new types of polystyrene, three being made by Dow and one by Koppers, the latter being offered at the price of standard polystyrene.

Kopper's P-8 polystyrene is a high heat resistant material. Dow's Styron 475 is declared to have improved toughness, with impact strength from three to five times greater than former formulations. Styron 637 is claimed to have increased resistance to light, and Styron 683 improved heat resistance.

Predictions as to further developments in the polystyrene field, spurred by the announcement of these new formulations, were rife. The inroads which the material has made in many fields were exemplified by housewares and toys in tremendous variety as well as by the industrial applications shown. Two Philco refrigerators, one a 1939 model and one a 1948 model, in the Monsanto booth, pointed up this trend. A 10-lb. polystyrene storage battery case made from its new P-8 in a single cavity mold was shown by Koppers alongside numbers of radio condenser trimmer tubes, 400 of which weigh a pound. Polystyrene wall tile was also proudly presented.

#### THREE NEW MOLDING COMPOUNDS

Plaskon's new alkyd resin molding compound (see Modern Plastics, October 1948, page 85)

received its first trade demonstration at the Exposition. Goodyear's new Tuf-Lite (see Modern Plastics, October 1948, page 99) was presented in molded products where impact resistance is of prime importance—golf clubs, golf balls, bowling pins, and football helmets. American Cyanamid's fast cure Beetle urea material and its special low price compound (see Modern Plastics, October 1948, page 188) were also featured in molded products. The same company's new translucent Melmac 404 was offered at the Show, particularly for use in buttons.

ere ing ing Th

tui

ing

Lu

lug

by

ma

un

sh

w

ca

a

an

an

us

in

th

di

pl

#### **HEAT-RESISTANT CELLULOSICS**

On the cellulosic side, both Celanese and Koppers forcefully brought attention to bear on their high heat resistant cellulose acetates while Hercules Powder Co., as a maker of flake, hood supporting displays. Electrical appliance parts, housings, and similar applications were featured.

The older and standard cellulosic materials and formulations received attention in the form of applications. Tennessee Eastman, for example, showed what could be done with extruded sheet acetate butyrate in a rapid forming process on a Taber drawforming press. The same company showed a large number of new toys as well as a Savage rifle forearm and stock molded from Tenite II.

#### VINYL DEVELOPMENTS

After several years of exploitation, nothing in vinyl looks really novel, yet there were many new angles to vinyl shown at the Exposition. Both Monsanto and Goodyear have come out with definite announcements that they are in production with new vinyls, the first with Ultron, the other with PlioVic, both used for coatings, in sheeting, and in other ways.

Goodrich showed a new use of vinyl paste in paper coating, and the first of the polyblend drapes made by O'Sullivan Rubber Co. The vinyl-coated Clopay paper drapes drew much attention while a set of molded paste printing rolls indicated further possibilities of this material in direct competition with rubber. Collar liners, shoes, decorative papers, and coaxial cable sheaths were but four of scores of representative vinyl applications displayed by Good-

rich. The floor of the Bakelite Corp.'s booth was covered with Delaware Floor Products' Vinylite flooring. In several booths were shown four-color printing on vinyl for draperies and other decorative uses. The new metallic vinyl formulations were granted good display by several fabricators and were featured by Bakelite and Presto. Woven saran is making considerable progress market-wise. Chicopee's Lumite was shown in several new products such as luggage and fishing creels.

#### LARGE ACRYLIC SHEETS

Size of sheet and, again, new applications were main points of the acrylic presentation. A new 100 by 120-in. Plexiglas sheet was shown which will make possible larger sizes of signs and architectural units than were ever practical before. Textured acrylics by both Du Pont and Rohm & Haas also showed important possibilities. Quite a bit of interest was evidenced in embedments of merchandise in cast acrylics for displays and ornamental purposes.

#### NYLON-MOLDED AND BRISTLES

New nylon bristles and bristle uses of industrial importance were shown by Du Pont. These included a huge brush for use in printing wide fabrics and another brush for cleaning rugs. Nylon gears and other machine parts for television sets, radios, and motion picture cameras illustrated a trend in the use of this material in molded form.

#### COLOR IN COLD MOLDINGS

Myler Plastics displayed several new and important items made from its cold molded material, now available in a wide color range. These include toys, buttons, and decorative units. The economy of the material was stressed.

#### PHENOLIC RESINS FOR INDUSTRY

The phenolic makers, adding up the interest evidenced by visitors, found that there were many more inquiries concerning phenolic resins for industrial use—with rubber, wood fabric, as coatings, etc.—than there were concerning phenolic molding compounds. Cross-examination of current interest indicates that the old war-horse continues to lead all other plastics in the way of broadening fields of application.

A new sawdust-phenolic board made by Curtis Companies, Inc., Clinton, Iowa, and featured at the Exposition by Monsanto, was a notable case in point. The board contains from 6 to 15% phenolic resin and appears to have great possibilities in the construction field. Bakelite Corp. showed several examples of industrial applications of resins including a special resin and dielectric curing method for sand cores used in foundry casting.

In phenolic moldings, however, there seemed no doubt that a trend has now been established to large size pieces. Durez had the first of the new Admiral television set cabinets on display in its booth; reports are to the effect that practically every television manufacturer is in some stage of tooling up for plastic cabinets!

Durez also had on display a sample of an extruded phenolic pipe produced on a Lester-Phoenix machine.

Developments resulting from war experience with the molding of phenolics in complicated large units with many inserts showed new possibilities. Kurz-Kasch had on display one dramatic example of such a unit which, it is reported, wlll lower cost and speed producton on motors for washing machines, refrigerators, and sewing machines.

#### POLYETHYLENE

Considering the past year's progress in the manufacture of polyethylene, the applications shown were surprisingly limited. Sheet materials held the main interest and, besides the packaging items by Plax, were featured in garment bags, protective garments, and even drapes. International Printing Ink Corp., Div. of Interchemical Corp., presented new and improved printing inks for vinyl and polyethylene, as did Heribert, Inc.

#### REINFORCED PLASTICS

As was to be expected, the low pressure laminate field received very little promotion, but what was shown was spectacular. The Beetle boat in the Exhibit of Award Winners in the Seventh Modern Plastics Competition and the Navy's personnel boat molded by the Winner company (see Modern Plastics, Oct. 1948, page 166) well illustrated the possibilities of large shapes made with reinforced polyesters.

Broader uses of glass mat with polyesters and with other resins were shown by Owens-Corning Fiberglas; importance was added to the examples by a probable continuing shortage of sheet metal for housings. Among other things was a low pressure molded washing machine tub now reported to be on a production basis.

An odd but effective use of glass mat and resin along with fluorescent pigments was shown by Polyplastex United, in a table lamp designed to be used by television owners. The lamp, provides bright illumination for ordinary use and soft, colorful glow for use when television is being watched. General American Transportation Corp.'s Co-Ro-Lite chair was another low pressure job which may be the forerunner of more small reinforced plastics products. American Cyanamid Co. had on exhibit bakers' tote boxes made of Laminac and glass mat.

In the high pressure laminates, Formi a's new Moon-glo design and an application of Farley & Loetscher's decorative laminate to kitchen cabinets on both horizontal and vertical surfaces, doors, etc., were most noteworthy.

#### MACHINERY

The machinery manufacturers reported vigorous sales activity at the show. Two developments in extrusion equipment were perhaps most outstanding. The Millstruder of National Rubber Machinery Co. (see page 192 this issue), which may be used for compounding and plasticizing material and for coloring polystyrene, created much interest. The new pelletizer of Modern Plastics Machinery Corp., which takes compounded rod material from one of the company's extruders and chops it into pellets for injection or extrusion, attracted great attention.

Whether these developments will in some measure affect the habitual business of thermoplastic material makers is a moot question. The use of extruding machines as compounders might mean that molders and others would buy acetate flake and plasticize and pigment to their own custom order, even pelletizing at the same time. In unplasticized thermoplastics, such as polystyrene and polyethylene, which it is claimed, can be better colored by such extrusion compounding than by tumble dyeing, it could mean the purchase by molders of uncolored material, with color added in the molding plant, plus pelletizing if required. The advantageous use of scrap is also a point in consideration.

The Haas laminator which will laminate photographs, maps, and pictures between cellulose acetate sheet stock on a continuous basis was worthy of note. Large-scale production of laminated parts is stated to be more economical on this unit than on a hot plate laminating press.

Moslo's 1½-oz. injection machine which has a clamping unit that can be rotated through practically any angle in relation to the injection unit was exhibited for the first time. This rotatable feature of

the clamping unit makes it possible to design gates at the optimum position and does not make it mandatory to have fixed gate location.

A 4-oz. machine of Lester-Phoenix was on display which was equipped so that the injection unit moves upward a small distance after each shot, this motion serving to close off the nozzle between shots—an advantageous device especially in molding material such as nylon.

A new high frequency, pre-heating unit for handling vinyl sheet strip in extruder feeding was shown by W. T. LaRose & Associates. Used to pre-heat vinyl stock for wire coatings, it operates on a continuous basis and is claimed to permit coating two to three times as fast as can be done with cold powder which is fed directly to the hopper of the extruding machine.

The recently introduced plating process of Distillation Products, Inc., was promoted as being competitive with and in many cases cheaper than standard electroplating methods and spray methods of plating plastics. For acetate sheet coating, the process is claimed to have much merit.

A special steam pre-heating unit for preform conditioning was shown by McCathrone Boiler Works.

The trend towards larger sizes of compression molded pieces mentioned previously is leading to a market for specialized large preforms. The Drackett preform units illustrated this trend. The Defiance preform presses (see Modern Plastics, Oct. 1948, page 90) which contribute to this same large compression molded piece trend was also exhibited.

An inventory of the plastics products shown at the Exposition would require far more space than can be allotted to this review. All those of significance have either been covered in recent issues of Modern Plastics or will be described in coming issues.

#### JUNIOR ACHIEVEMENT

One new factor in the industry picture was called to attention by the booth devoted to the Junior Achievement Award sponsored by S.P.I. Three awards were given, one to the Plasteen Company of Chicago, a teen age organization sponsored by the Visking Corp., and two honorable mentions to Keen Plastics, Chicago, a junior achievement company sponsored by International Harvester Co., and Newest Novelties Co., St. Louis, Mo., sponsored by Stewart Auto Repairs. S.P.I. judges of this Junior Achievement Plastics Products Award were: Donald S. McKenzie, general sales manager, Chemical Dept., General Electric Co.; S. Jack Helsper, sales promotion manager, Mack Molding Co.; and James F. O'Brien, industrial engineer. Bakelite Corp.

Fo

int

fis

no

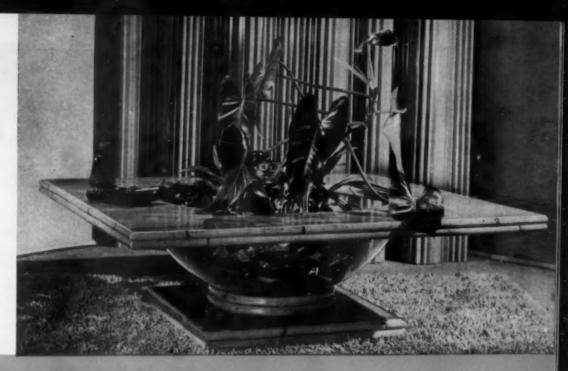
ab

de

as

th

co



Converted blister forms receptacle for growing plant and adds an unusual note to this coffee table

#### War-Plane Blisters in Peace-Time Use



Another table using an acrylic dome has transparent top which shows plant off to good advantage

ROM a B-29 ready for action in enemy skies to the restful interior of a modern home is a big jump, but one which has been successfully accomplished by blown acrylic domes. An ex-Air Force sergeant who was assigned to B-29s during the war has taken surplus blisters and converted them into ultra-modern coffee tables. Some are also giant fishbowls; others contain plants to add an outdoor note to a living room. Two of the latter are illustrated above. One has a transparent top through which the decorative plant beneath can be seen. The other has a square wooden top with the center cut out to allow the plant to grow freely above the table.

Tropitan and other unusual woods are used in combination with the blisters to form a variety of designs. The furniture is being manufactured by Tropicmode Furniture Co., Hollywood, Calif.; the blisters used were blown from Lucite or Plexiglas sheets by the Swedlow Plastics Co., Los Angeles, Calif., for the Armed Forces during the war.

#### Durable, easy to clean

The qualities required of the plastic domes for use in airplanes give them additional advantages in their present use. Special care was taken to make them optically clear and exceptionally strong. This strength means long wear without danger of breaking from accidental kicks or blows in the home. Easy to clean, the domes can be kept scratch-free by occasional waxing.

# DISPOSABLE NURSING BOTTLES



1 — Mother holds bottle by rigid melamine locking ring. Bottle itself collapses as baby drinks. No vacuum forms behind the fluid

Rolls of polyethylene layflat tubing are heat sealed to form sterile, unbreakable,

leak-proof bottles which end the need for "burping" babies during feeding

IKE many other familiar items used in the home, the baby's nursing bottle is not a thoroughly efficient, convenient device, and its design has not changed materially for years. However, science has been at work on this problem and has evolved what promises to be a vast improvement. Last month saw the market debut of a plastic bottle which is unbreakable, sterile as it comes from the package, disposable, and a more efficient method of feeding a baby.

The new product, called the Shellie Nurser, is manufactured by Shellmar Products Corp., Mount Vernon, Ohio. The flexible, bag-like bottle proper is a layflat tube of plastic film, bar heat-sealed at one end and attached at the other to a specially designed nipple with two rings — one metal and one plastic. A plastic cap which keeps the nipple sanitary and makes the bottle leak-proof completes the assembly.

The main purpose in mind when Shellies were under development was the production of a disposable bottle which would obviate the necessity for washing and sterilizing bottles. But the use of a flexible plastic film in place of a rigid bottle results in another advantage which is at least as important as the convenience factor. The polyethylene bottle

collapses as the formula leaves the bottle. Thus no vacuum forms behind the liquid, the nipple will not collapse, and the baby can empty the bottle easily. As a result, the feeding takes less time and is more satisfactory.

3 to

at 1 4-oz T

Who

mat

ster

stair

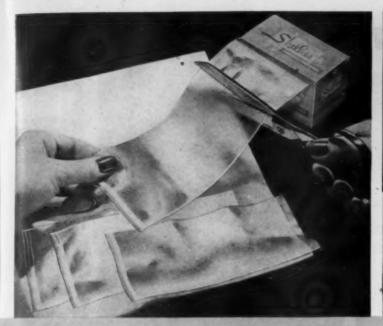
Who

The fact that the baby does not swallow large quantities of air makes it unnecessary to "burp" the baby at intervals during feeding, and prevents the baby from getting "air colic." The air which is in the bottle is removed before beginning the feeding by squeezing the bottle until the liquid begins to come through the nipple. The same method can be used to clear the holes in the nipple if they should clog.

The light over-all weight of the plastic bottle is also an advantage. It makes it easier for a small baby to learn to hold the bottle (Fig. 1), and the warmth and soft, resilient feel of the bottle seems to be pleasant to the baby. When the baby finds out how to hold the bottle, and to throw it out of the crib, there is no problem of breakage as there is with glass bottles.

#### Polyethylene and melamine used

The material used for the bottle itself is Shellene, a special formulation based on polyethylene powder supplied by Du Pont. With this material,



2 — Bottles are cut from roll of layflat tubing. Cut is made 1/2 in. ahead of transverse seal which forms the closed end of the next bottle



3 — Bottle expander (center) is used to open mouth of bottle and fold it over ring on bottle rack. Ring is visible at left

Shellmar extrudes continuous tubing with a wall thickness of 0.002 in. and a layflat width of from 3 to 31/8 inches. The tubing is then bar heat-sealed at regular intervals to divide it into bottles with 4-oz. or 8-oz. capacity.

The outer locking ring of the bottle and the top cap are molded of pink or blue Melmac by the Wheeling Stamping Co., Wheeling, W. Va. The material was chosen because it can be boiled for sterilization without dimensional distortion. The stainless steel bottle expander has a plastic handle. Wheeling Stamping Co. molds some of the handles

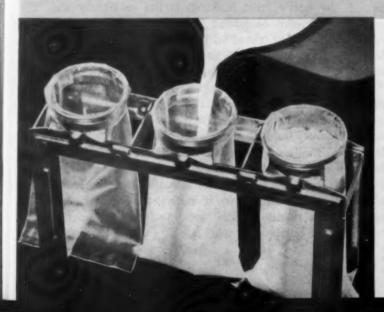
of melamine. Still others are being molded of Durez phenolic.

#### Rolls of sterile bottles extruded

The film for the bottles is extruded at a temperature of more than 400° F., which is so far above the temperature required for sterilization that it is certain to kill all forms of bacteria. The bottles are then sealed and packaged in a room which is as sterile as most hospital operating rooms. Trichlorethylene-glycol is sprayed into the air conditioning system and powerful germicidal lamps are used

4 — Wide-mouthed bottles can be filled with milk quickly and easily. No funnel is needed, thus there are fewer items to be sterilized

5 — Wide-rimmed nipple is put on by snapping the rim down. Melamine locking ring holds the nipple in place







6 — Melamine cap engages three lugs on upper edge of locking ring. Cap prevents bottle from leaking, keeps nipple sterile



7 — Low aluminum rocks fit into refrigerator. Bottles can also be stored without rock or packed in a suitcase without looking

directly on the film and packages as well as throughout the rest of the room.

As a further precaution, each batch of Shellies is given a code number as it is produced. A bacteriological examination of both inside and outside surfaces of samples from the batch is then made. No batch is shipped from the factory until its code number has been cleared from a bacteriological standpoint. Thus far all have been satisfactory.

The rolls of Shellies are packaged in dispensertype cartons so that the bottles can be pulled out and cut off as they are needed. Each roll contains 65 8-oz. bottles or 100 4-oz. bottles. The rolls are sold as part of a Shellie Nurser kit, or as refills for consumers who already have the kit.

#### How bottles are used

Before filling Shellie bottles, a mother only has to sterilize the nipples, the bottle expander, and the outer caps which are used to cover the nipples. The aluminum expander rings, which do not have to be sterilized, are simply placed on top of the bottle rack. The user then cuts the number of bottles she needs off the roll with sharp scissors (Fig. 2).

By using the sterilized bottle expander, she can then open the mouth of each bottle without contaminating the sterile interior surface of the bottle. The expander holds the mouth of the bottle open wide enough to fold over the expander ring. The bottle is put in place by putting it through the ring and pressing down on the expander (Fig. 3). When the lip of the bottle is in place around the ring, the expander automatically clicks open and releases the bottle.

With the bottles in place on the rack, they can be filled easily and rapidly (Fig. 4). Because of the wide mouth of the bottle, no funnel is necessary. After the bottles are filled, the nipple is put on by simply setting it on top of the bottle and turning down its wide lip. The nipple fits on more easily than ordinary nipples because it does not have to stay in place with its own pressure, and therefore can be loose-fitting. The plastic outer ring is then forced on and the nipple and bottle are held tightly between the inner and outer rings (Fig. 5). The ring must be dipped in water before it is put on so that it will go on over the nipple more easily.

The sterilized top cap which covers the nipple locks in place by engaging three molded-in lugs on the top edge of the outer locking ring (Fig. 6). A molded-in seat on the inside of the dome-like cap fits tightly against the top of the nipple and prevents the bottle from leaking. It fits so tightly that the bottle can be stored lying on its side, dropped, or packed for travel without leaking.

The contents of the bottle can be heated before the feeding by putting the bottle in a small pan of hot water, but the bottle must be removed from the flame before immersing the Shellie. The plastic bottles heat so fast that they can be warmed by merely holding them under hot water from a faucet.

Shellies and the Shellie Nurser unit (Fig. 7) have been extensively tested in both hospitals and homes. It has been observed that babies nursing from Shellies have a tendency to take their full feedings much more readily and in less time than is the case where rigid bottles are used.

MODERN PLASTICS

92

Be der gra and The investigation with It man alth

9:00 20; and T

ject

hele

and

Film bine Arm "F der,"

ing,'
Ame
"S
Part

Mold Co. "N Fow!

Rubl "C poun "N

Plast Instit

#### Annual S. P. E. Technical Conference

#### Details of the program to be presented next January and of the technical papers to be read

HE Annual National Technical Conference of the Society of Plastics Engineers will be held on January 19, 20, and 21 inclusive, at the Hotel Bellevue-Stratford, Philadelphia, Pa. National President J. H. DuBois has announced that a broad program has been prepared covering technical problems and data of national interest to the plastics industry. The program has been selected after considerable investigation to find the voids in available technical disclosures and to determine the nature of problems which merit national discussion.

Dr. Russell B. Akin, Speakers Committee chairman, has practically completed the entire program although there is a possibility that additional subjects of importance will be incorporated in the program at a later date. The technical meetings will be held between 9:00 a.m. and 12 noon, and 2:00 p.m. and 4:00 p.m. on Wednesday, January 19; between 9:00 a.m. and 12 noon only on Thursday, January 20; and between 9:00 a.m. and 12 noon, and 2:00 p.m. and 4:00 p.m. on Friday, January 21.

#### Papers to be presented

The speakers and titles of their technical papers are as follows:

"Quartermaster Research Program on Plastic Films and Coated Fabrics," by Dr. W. A. Stubblebine, Office of the Quartermaster General, U. S. Army.

"Flame Resistant Cellulose Acetate Molding Powder," by B. E. Cash, Celanese Corp. of America.

"Choice and Treatment of Steels for Mold Making," by Peter Payson, Crucible Steel Company of America.

"Silicones as Mold Release Agents for Hot Mold Parts," by W. A. Wiard, Dow Corning Corp.

"Sapphire Polishing Compounds for Plastic Molds," by Roger F. Waindle, Elgin National Watch Co.

"New Geon Molding Compositions," by George A. Fowles, B. F. Goodrich Chemical Co.

Tuflite," by Dr. L. B. Sebrell, Goodyear Tire & Rubber Co., Inc.

"Cel-F Monochlorotrifluoroethylene Molding Compound," by Louis C. Rubin, M. W. Kellogg Co.

"New Testing Procedures Being Developed for Plastics," by Prof. Albert G. H. Dietz, Massachusetts Institute of Technology.

"Plasticizers," by J. Kenneth Craver, Monsanto Chemical Co.

"Trouble Shooting on Compression Molding Problems," by Mario Petretti, Noma Electric Co.

"Plaskon 420 — New Type Thermosetting Molding Powder," by Maurice H. Bigelow, Plaskon Div., Libbey-Owens-Ford Glass Co.

"Princeton's Graduate Engineering Program in Plastics and Some Aspects of the Army-Navy Research Program on Plastics," by Prof. L. F. Rahm, Princeton University.

"Satusply — A New Plastic Wall Surfacing Material," by R. M. Paulsen, U. S. Rubber Co.

"Design of Hydraulic Equipment and Recent Advances in Hydraulic Controls," by Richard Dinzl, Watson-Stillman Co.

"Future of Plastic Films," by M. R. Gerow and Dr. R. G. Kadesch, Reynolds Metals Co.

#### **Business** meeting

The annual meeting of the Society of Plastics Engineers, Inc. will be held at 1:00 p.m. on Thursday, January 20, also at the Bellevue-Stratford Hotel, in connection with a luncheon meeting, open to all S.P.E. members. The national directors will meet on January 19 to formulate policies for the ensuing year and to hold an election of officers who will officiate during 1949.

#### Conference booths

Surrounding the meeting rooms in the conference hall is a large group of small booths which will be used as conference rooms. Technical representatives of the various suppliers to the plastics industry have been invited to take over these spaces for consultation purposes. Engineers attending the technical meetings will thus be able to confer with specialists qualified to discuss each of the various materials and processes of the industry. A limited number of small exhibit spaces are also available. This use of small conference booths is in line with the new policy of the Society of Plastics Engineers which provides that the annual meeting will be as nearly self-sustaining as possible, but at the same time will not have as its object the earning of any substantial sum of money for budgetary purposes other than for the actual expenses which are incurred in connection with the conference.

#### MODELS DEMONSTRATE HUDSON



Measuring 13 in. in length, Hudson's new plastic model demonstrator is one of the most highly detailed miniatures yet to be utilized as a sales aid. "Step down" feature of new Hudson is dramatized in model, which is molded in Lumarith

HIGHLY detailed all-plastic miniature car, believed to be the most effective and dramatic sales tool ever developed to demonstrate automobile features, is being utilized by Hudson Motor Car Co. to emphasize the exclusive "step down" principle of design embodied in the new Hudson.

An exact plastic replica of the new Hudson four-door sedan, the model is precision-built to 1/16th scale and is designed for dealers' use as a quick and dramatic means of showing prospects the combination of important features made possible by Hudson's new design principle.

Considerably larger than ordinary "toy" autos, the model Hudson is a full 13 in. in length. One side of the demonstrator model is finished in two-tone colors, while the other is left transparent to enable the salesman to show construction details and placement of the seats.

Hudson's Monobilt body-and-frame construction is shown in red plastic, making it a simple matter to point out the rugged basic structure and unique frame design. The underside of the car is faithfully reproduced so that the model may be turned over and the entire underframe structure shown to prospects. In addition to the transparent models for dem-

onstration purposes, Hudson is using full-color plastic models in window displays, as gifts to customers, and for other promotional purposes.

Building of the model was regarded by Hudson as a project of prime importance. The Hudson engineering department, in collaboration with plastic technicians, produced special scaled-down blue prints for the miniature cars from the actual prints used to build dies for the full-size Hudsons. Made under the direct supervision of the Hudson engineers, the stainless steel die sets used in producing parts for the models required four months for completion and cost \$35,000.

#### Parts are cemented

American Plastics Engineering Corp., Detroit, Mich., handled engineering work on the model—which included design of all plastic parts from an original wood model—mold design, and mold building. The 27 plastic parts which comprise the car are molded and assembled by Detroit Macoid Corp., Detroit, Mich., which has set up a miniature assembly line on which the parts are cemented together. All miniature components are injection molded in Lumarith cellulose acetate. (Continued on page 97)

# CAR FEATURES



Newest of Detroit's "assembly lines" is this miniature line on which replicas of the 1948 Hudson take shape



Removing model Hudson body from one of six combination molds used in demonstrator. Body pieces run in transparent material

Front and rear wheels (below) are assembled to panel-covered frame of car. Models on the line begin to assume final shape 4



Frame of car is produced of red acetate, in seven-cavity combination mold. Shown also in photo at left are differential and rear axle housings with wheels, hub caps, and springs in place



In next assembly step, seats are placed within frame and on recessed floor of model. Construction duplicates that of the full-sized car, with frame surrounding passenger compartment



Like the rest of the model, detailed instrument panels, shown being installed at right, are 1/16 of full size



Rocker panels are cemented in place, and body-and-frame units are assembled as cars proceed along line. Some of the bodies shown have been colored on one side and left clear on other for visual examination

At this point in the assembly line, the front bumper of the model Hudson is added to front fender-grille-bonnet section, then latter is assembled to the rest of the cor as a unit in next operation



Six combination injection molds produce the parts for the model Hudson. The mold for the red frame is a seven-cavity combination die incorporating one cavity for the frame base, one cavity each for right- and left-hand front side members, one cavity for the front top support, one for the front spring frame, and two cavities for the braces.

A five-cavity combination mold is used to produce the panel section, which is cemented to the frame, while the aluminum colored bumpers, side chrome strips, and hub caps, axles, and nameplates are made in a ten-cavity mold. Seats and instrument panel are molded in a three-cavity family mold consisting of one cavity for the instrument panel and one each for the front and rear seat.

The body of the car is produced from a single-cavity die which forms the lower panel on both sides; another single-cavity mold produces the hood, front fenders, grille, parking lights, etc., in one piece.



Final step in the assembly of the Hudson model comes when the rear bumper is cemented in position. So efficiently are molding and assembly operations integrated at the plant that a model comes off the line every minute

As the scale models reach end of assembly line, they receive final inspection and are then wrapped in tissue paper before being packed in boxes for shipment to Hudson dealers. Latter get complete instructions on use of model

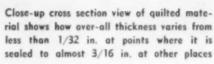
Front section joins rest of car on final assembly line as replica nears completion.

This photo shows the glistening two-tone color combinations in which the model cars are finished



Vinyl material between 8 and 20 mils thick is electronically heat sealed through collulose filler to 4-mil clear color vinyl back sheet. For wall covering applications, vinyl impregnated paper back sheet (far right) is used





## Stitchless Quilted Vinyl

New decorative applications of vinyl sheeting have been made possible by the introduction of a new quilted vinyl upholstery and wall covering material. Sealtuft, as the new material is called, is quilted without stitches by electronically heat-sealing two vinyl sheets to each other through a cellulose filler.

Sealtuft is manufactured in a wide variety of colors by The Jason Corp., Hoboken, N. J., which has applied for a patent on the process. For the front surface of the "sandwich," Jason uses Boltaflex, Duran, or Vinylite, either plain or embossed to resemble moire, taffeta, sharkskin, or leathers. The sheet used is between 8 and 20 mils in thickness. The filler is a cellulose material which is said to be fire-retardant, and the back sheet is 4-mil vinyl film in clear color, or vinyl impregnated paper.

The three materials are fed into the heat-sealing equipment in continuous rolls ranging up to 54 in. in width. The diamond pattern is then sealed into the material with electronic equipment specially designed and manufactured for Jason. The sealing is done right through the filler and the thickness of the finished sandwich at the points where it is welded is only slightly greater than the combined thicknesses of the two vinyl sheets. At other points, the Sealtuft

material is about 3/16 in, thick. The end result is a material which appears to be heavily padded and is therefore rich looking.

The use of heat sealing rather than stitching to quilt the material insures a uniform pattern and neat appearance. It also preserves the valuable waterproof quality of the vinyl sheeting which would be destroyed if the vinyl were pierced by stitching. The fact that it is sealed at frequent intervals (the diamond pattern is 2 by 3 in.) actually makes Sealtuft stronger than ordinary vinyl sheeting. It can, however, be cut, sewed, tacked, or sealed readily in the same manner as any other vinyl material.

Because of its advantages in addition to the usual color possibilities, scuff resistance, and abrasion resistance of vinyl, Sealtuft has found a ready market as an upholstery material. The desk chair shown in an accompanying photograph is only one of a number of pieces which have been finished in Sealtuft by Valley Upholstery, New York, N. Y. The material has also been adopted by Thonet Bros., Inc., New York, N. Y., for some of its modernistic molded plywood chairs.

In a new nursery furniture set manufactured by Lullabye Furniture Corp., Stevens Point, Wis., Sealtuft is used on the chair, the sides of the chests.



Desk chair upholstered with new quilted vinyl material which combines rich appearance with usual advantages of vinyl



Attractive automobile upholstery installation uses quilted vinyl for seats and doors, unquilted vinyl for trimming

and the bed. Another interesting application of plastics in this set is the clear Plexiglas guard rail on the youth bed. The rail is fabricated by Klise Manufacturing Co., Grand Rapids, Mich. The drawer-pulls on the chests are also clear Plexiglas.

In the automobile upholstery field, Sealtuft has only been used on an experimental basis to date. However, the manufacturer feels that the material may soon find a place in that market. The suitability of the material has been proved by the installation shown in an accompanying photograph, where grey Sealtuft is used in combination with an unquilted maroon vinyl.

The material is also expected to find a large market as a material for headboards for beds, a field in which quilted materials have long been standard. The Commodore Hotel in New York has ordered Sealtuft for headboards and wall treatments. The installation is being made by Walter M. Ballard Corp., New York, N. Y.

In addition to the vinyl-backed Sealtuft for upholstery applications, Jason is also making the material with a back sheet of a heavy vinyl-impregnated paper. This makes the material suitable for bonding to walls, in which form the material has been used in a showroom designed and executed by Jac Lessman, New York, N. Y.

Jason has also developed a Fiberglas filler for applications, such as aircraft interiors, where added acoustical or thermal insulation is desirable.

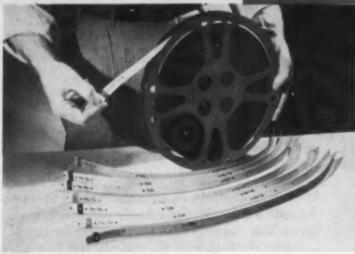
Quilted vinyl is both attractive and practical for nursery furniture. It will take hard usage and can be cleaned easily. Note the fabricated acrylic guard rail on bed and the acrylic handles on drawers





A scalp massager and hair brush are combined in the Brussage, manufactured by Brussage, Inc., 1520 Locust St., Philadelphia 2, Pa. It consists of 45 flexible plastic fingers which rotate individually in a plastic brush back to stimulate the scalp. Dirt and dust are said to be drawn from the hair to the plastic by static electricity. Molded of Tenite cellulose acetate by Atlantic Plastics, Inc., 131-32 40th Rd., Flushing, N. Y.

# PLASTICS





A quick and safe means of banding movie film for storage or shipment is provided by Pro-Tex reel bands made of ethyl cellulose in a variety of colors. Marketed and distributed by Pro-Tex Reel Band Co., Cleveland, Ohio, in 16 and 35 mm. sizes, these bands permit easy labeling and act to brace reel flanges. Metal clips hold bands firmly in place

Travelers and game addicts will like this handy and compact cribbage board which folds up when not in use to hold a deck of cards and the required pegs. Automatic Button Co., 726 Wilhelm St., Harrison, N. J., molds the case of Lustron polystyrene for Nelson Products Co., 653 Schuyler Ave., Arlington, N. J.



The days of rummaging through a jumble of nail files, combs, brushes, powder boxes, etc., in a dressing table drawer to find an equally important beauty accessory are over, with the advent of the Vanity Organizer. This plastic tray, measuring 12 by 15 by 2 in., is subdivided so there is a place for everything. Breyer Molding Co., 2536 W. Lake St., Chicago, III., molds tray of ivory Beetle urea formaldehyde for W. F. Goodell Co., Louisville, Ky.

A prospective builder can set up various types of houses — ranging in size from four to eight rooms — even to the furniture, with a model house kit manufactured by Plan-A-Home Model Co., Elkhart, Ind. The kit consists of Tenite cellulose acetate butyrate footings extruded by Industrial Plastics Corp., Elkhart, Ind., cardboard wall sections, furniture cutouts, and layout sheets. Each ½-in square represents one square foot

# PRODUCTS



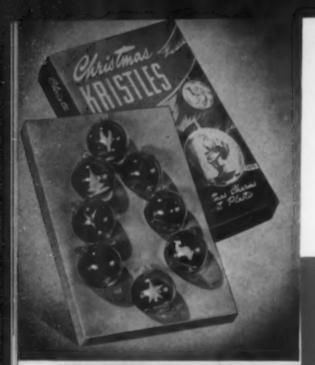
Two spacious compartments and an adjustable strap are features of this Lumite woven fabric fishing creel, which is easy to wash with soap and water. Made of saran by the Lumite Div., Chicopee Mfg. Corp., 47 Worth St., New York 13, N. Y., the creel is marketed by the Angler's Product Co., 85-09 57th Ave., Elmhurst, L. I., New York

Messages and notes on the day's work can be recorded in pen or pencil on this writing pad of Vinylite plastic sheet. At the end of the day, notes and messages can be checked over, then removed by a special remover fluid that comes with the pad. These units have a variety of uses — for preliminary sketches and layouts, for conference notes, in schools, etc. Manufactured by the Ruhl Development Co., 241 16th St., Toledo, Ohio

The soft glow of the translucent lamp shade, with its gay decals, makes this lamp especially attractive for a baby's room. Emeloid Mfg. Co., 1290 Central Ave., Hillside 5, N. J., injection molds the round base of white Lustron polystyrene, and the panels for the shade and stand of Lustron in pastel colors. Panels for the shade are assembled on a wooden jig and cemented together. Grooves are molded in to accommodate metal ring which supports the shade





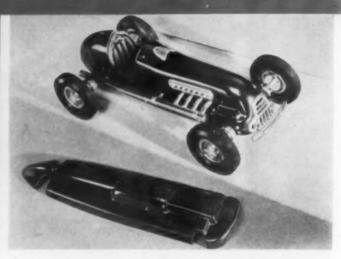


Colorful additions to any Christmas tree are these polystyrene Christmas Kristles, round versions of Koo Zoo toy blocks with holiday characters. Molded of Lustron or Styron by Kusan, Inc., Henderson, Ky., these ornaments are shatterproof, washable, and non-flammable. Each has a loop, molded as an integral part of the globe. After Christmas, the colorful Kristles may be hung on baby's play pen

# PLASTICSF



High heat resistance, light weight, smooth surface, and color range of Melmac urea formaldehyde led to its use in the housing of a new electric dryer marketed by the LeJohn Mfg. Co., Huntington, W. Va. The unit can be used for drying hair, hands, or lingerie, for defrosting refrigerators, etc. International Molded Plastics, Inc., 4387 W. 35th St., Cleveland, Ohio, molds the housing



A gas-engined model racing car which can take plenty of rough handling is being made and marketed by Reuhl Products, Inc., 2609 Monroe St., Madison, Wis. The body is a compression molded laminate of Fiberglas, Durez phenolic resin, and a wood flour filler. This combination was found to give an extremely high strength ratio with low material, molding, and die cost



Newest aid to hunters is the Duc-Em game call, available in three types: individual duck and crow calls, and a combination type with two sounding mechanisms that can be used interchangeably in the same holder. All are fitted with phosphor bronze reeds, are virtually unbreakable, and are unaffected by dampness. Molded of Nixon CA cellulose acetate by Dillon-Beck Co., Hillside, N. J., for Oliveros Mfg. Co., Box 715, Houston, Texas

Model railroad enthusiasts can now build a 3/16-in. scale model Alco diesel switcher from a kit of Tenite cellulose acetate butyrate and metal parts. The highly detailed parts are assembled with solvent cements. Plastic is used for the five-piece cab, hood, exhaust stack, two filler caps, and S-gage track ties. Manufactured by The Robert L. Miller Laboratory, 900 N. Washington St., Valparaiso, Ind.

# PRODUCTS



A switch to plastics — in this case, to Celcon ethyl cellulose for a clock housing — is said to provide a better looking and longer wearing product with added economy in manufacture and shipping. Manufactured by the United States Time Corp., Waterbury, Conn., this Ingersoll Ami alarm clock comes in various colors and features a single wind-up key

There's ice cold water at your fingertips with this square style water jug which holds more liquid than the conventional bottle, yet takes up a minimum amount of space in the refrigerator. Ease of cleaning and wide color range led to the use of Lustron polystyrene in the top and spiggot. Molded by Formold Plastics, Inc., 3145 S. Wabash Ave., Chicago, Ill., for Haskey Co., 1741 N. Pulaski Rd., Chicago

Youngsters just naturally revel in snow, whether in the form of drifts, snowballs, or snow men, and in the past any extended play period has led to water soaked mittens. An answer to this vexing problem has been found in these Vinylite plastic mitts which can be worn over regular woolen gloves or mittens and shed water just like Donald Duck, whose picture decorates their backs. Made by the W. S. Rainford Products, Inc., Closter, N. J.



# delivery?



# AT MIDLAND IT'S FASTER THAN A CAT CAN HAVE KITTENS!



This wall socket hobbed cavity by Midland incorporates two narrow T projections raised 3/16 inches above the cavity surface. By using hobbed cavities of this type in place of the conventional insert cavities, all unsightly parting lines were eliminated and in addition to improving appearance, the hobbing was accomplished at only a fraction of the cost of cavity duplication by machining methods.

Yes, actually! It takes a cat nine weeks—and on most hobbed cavity jobs we do a lot better than that! Our skilled craftsmen, our machining, engraving and hobbing equipment are working constantly, accurately on a schedule that means delivery of hobbed cavities in a matter of weeks—not months. Whenever you order from Midland you are assured the kind of accurate, uniform, perfectly finished hobbed cavities that only skill and experience can provide.

So if limited molding capacity and long quoted delivery are holding you back, grab the problem by its neck and bring it to Midland where delivery is shaved to a cat's whisker.

For a clear picture of our equipment and our know-how, write for a copy of "Shaping Tomorrow Today." Better still, send your blueprints!

MIDLAND DIE AND ENGRAVING COMPANY
1800 W. BERENICE AVENUE . . . CHICAGO 13, ILLINOIS

Makers of Plastic Molds . Die Cast Molds . Engraved Dies . Steel Stamps . Hobbings . Pantagraph Engraving



#### PLASTICS ENGINEERING"

F. B. STANLEY, Engineering Editor

#### PLASTICS IN REFRIGERATORS



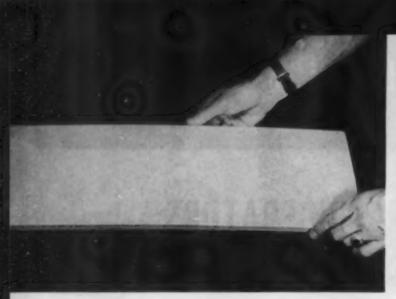
1 — Ethyl cellulose frame, upper left, weighing 25 oz., is shown above in place in refrigerator

THE production of injection molded parts of great projected area, as well as substantial weight, is an old story at the Plastics Div., The Standard Products Co. This plant pioneered a great deal of the early work done on large moldings, particularly in the use of multi-nozzle injection equipment. Most of this first work was accomplished with the four-nozzle machines which are still in operation after 10 years of service. The first of these machines was designed, built, and put into operation in 1937 and two more were added shortly after.

There is no denying that during those early days there were times when the entire venture into large moldings seemed unwise. Possible users of such parts besitated to adopt them because of the lack of service data on parts of such a size, as well as the unreliability of many of the materials then available. During those times, the equipment proved itself by run-

Thermosetting materials, especially laminates, have been important materials in refrigerator construction for many years. Post-war refrigerator design dictated a large changeover from metal to thermoplastics not only for purely decorative effects but to a large extent for structural and functional parts. The two accompanying articles are devoted to 1) a molder's experience in producing large thermoplastic parts for many different refrigerators, and 2) a complete breakdown of the use of plastics, as well as the reasons for specifying certain materials for different applications, in the new Crosley refrigerators. This breakdown shows that six different plastic materials are used in this refrigerator.

<sup>\*</sup>Reg. U. S. Patent Office. †Plant manager. !Formerly process and methods engineer. Plastics Div., The Standard Products Co., Detroit, Mich.



2 — Polystyrene evaporator door liner weighs 1 lb., has a projected area of 198 square inches



3 — One of the largest injection molded pieces ever produced is part of refrigerator baffle

pai

ref

eth

Lo

mi

the

We

has

mo

mo

in.

ob

the

tur

is s

lan

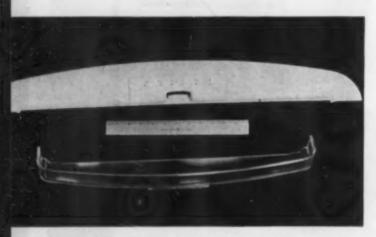
of

the

As

18.

use



5 — Breaker strip (top) and basket for Philco refrigerator door, with foot rule for comparison

ning four different molds with different colored materials in each. From the very first, however, a great deal of fundamental knowledge and information on the technique of molding large parts has been accumulated, including such factors as mold design (for runners and gating), tunnel and mold temperatures and, above all, the proper synchronization of action of the four tunnels to produce the ultimate physical characteristics in the molded part. Several large single-nozzle machines up to 40-oz. capacity have been added during the past two years to round out the molding versatility of the division.

Among the many large pieces that have been molded during the past year, several are worthy of

# RVI OR

6 - Removing polystyrene refrigerator door baskets from the mold in which they are produced

#### Plastics and the

ATERIAL analysis of the 1948 model refrigerator produced by the Crosley Div., Avco Mfg. Co., shows an increase in the use of plastic materials for structural and functional parts and a surprisingly small amount used for purely decorative effect. This refrigerator was designed to obtain maximum decorative value from functional and structural parts by the use of plastics.

The buying public awaited first post-war refrigerator designs, anticipating sleek plastic and chromium models. War-time development of volume production of polystyrene, together with improved molding processes, provided designers with materials suitable for refrigeration usage. With public demand for plastics and with materials available, Crosley engineers and stylists have designed into some models of refrigerators 92 separate plastic

<sup>\*</sup>Refrigeration engineer, Crosley Div., Avco Mfg. Corp.



4 — Refrigerator breaker strips, each 321/2 in. long by 4 in. wide, are made in a two-cavity mold

note as examples of the ends achieved. One of these parts is the evaporator frame for the Westinghouse refrigerator shown in Fig. 1. This part is molded of ethyl cellulose and the shot weighs over 25 ounces. Lower injection pressures on the four cylinders permit the rapid molding of this piece without flash in the slots around the inside of the frame. Figure 2 shows an evaporator door liner also produced for Westinghouse. This piece weighs nearly 1 lb. and has a projected area of 198 square inches. It is molded of polystyrene using two tunnels, and the mounting holes around the outside edge are molded in. By gating at the parting line it is possible to obtain a flat molded surface without the mark or

indentation that would result if the part were molded on a conventional single nozzle machine.

# Part weighs 30 ounces

Figure 3 shows one of the largest pieces ever injection molded. This part, which is one of a two-part assembly for the Crosley refrigerator, has a projected area of 364 square inches. It is molded of polystyrene on a 60-sec. cycle and weighs 30 ounces. [See also article immediately following. - Ed.] An interesting bit of experimental work was done before the mold was built for this piece, in order to be sure that the clamping pressure of the press would be adequate for the job. Using an old mold base, a flat sheet 31% by 111/6 by 3/32 in. was molded. This was accomplished without flash and without the necessity of double-shooting. On the basis of these data, the mold was built and has produced many thousands of pieces without the slightest difficulty.

In Fig. 4 is shown a shot from a two-cavity mold for a breaker strip used in the Philco refrigerator. These parts are molded from polystyrene in a 16-oz. H.P.M. molding machine. Each of the pieces is 32½ in. long and 4 in. wide. The lower piece in Fig. 5 is the Conservador basket, also molded for Philco. Figure 6 shows these parts being removed from the mold. In the very near future the core and cavity units from this mold will be rebuilt in a base that will permit these parts to be run in the 40-oz. single nozzle machine recently added to the plant equipment.

# Crosley Refrigerator Design

parts, whose combined weight totals 18¼ pounds.

The table on page 109 shows the distribution of these plastic parts in the Crosley refrigerator. It will be noted that 97.5% (by weight) are for structural and functional uses, while the remaining 2.5% goes into parts used solely for electrical and thermal insulation or for decorative purposes. Further it is seen that on a weight basis, use of polystyrene and laminated phenolics is practically equal, each type of material accounting for approximately 49% of the total. The balance of 2% is made up of methyl methacrylate, urea, phenolic, and cellulose acetate. As a further comparison, the total plastic weight of 18.284 lb. is 5.54% of the total refrigeration weight.

A breakdown of this total shows that plastics are used in the following five general classifications:

1. Structural ...... 9.695 lb.

 2. Functional
 8.135 lb.

 3. Decorative
 0.159 lb.

 4. Electrical insulation
 0.225 lb.

 5. Thermal insulation
 0.070 lb.

In order to obtain "value" and "eye appeal," many structural and functional parts are made of plastics so that they are both decorative and useful. As is shown above, only 0.159 lb. are for purely decorative purposes; however, a total of 17½ lb. adds to the appearance of the refrigerator in one way or another. This leaves a total of only ¾ lb. of plastics used strictly for construction purposes alone.

# New problem

Adding to the increased use of plastics, the frozen food compartment, a part new in refrigerator design, brought designers face to face with a new prob-





mu fab inte

turition of duction of come tion I are ity.

whi

the

ma

Two views of the Crosley SD 108 model refrigerator, showing plastic frame, baffle (under top frozen food compartment), shelf supports, food storage trays, etc.

lem: that of providing for temperatures too cold for the normal food storage space. This problem was solved by the use of a barrier structure separating the freezing compartment from the normal food storage space. The design of this barrier was based on the requirements that it be sufficiently strong to support a food storage tray; the upper surface must be shaped to collect water during defrosting; it must be insulated to maintain temperatures above the dew point on the lower surface although the upper surface is exposed to low temperatures; and its decorative design must be in keeping with the general styling of the refrigerator in which the baffle is to be used.

Embodying all of the above requirements is an injection molded polystyrene baffle having 364 sq. in. of projected area, reportedly the largest part in projected area ever produced. This part is a shallow tray made of two sections which are solvent "welded" together into a single part. The space between the sections is filled with glass or mineral wool for insulating purposes. Interior ribs are provided for strength. The front edge is curved to conform with adjacent parts and is made with decorative grooves. The general design of this part is such that it can be made by either injection molding or by hot post forming of compression molded sheets.

### New appeal

Food storage trays within the refrigerator are transparent to provide the eye appeal of "seethrough" receptacles. These 5-in. deep polystyrene trays are made with thin wall sections which have a draft angle of only 1½°. The molds are highly polished and the trays are exceptionally clear and bright. To further enhance their beauty, a chrome "picture frame" type handle is attached which allows full vision of the trays' contents. For those models where a step-down in cost or styling is required, these trays are molded with integral handles. In addition to the eye appeal, these plastic trays offer the designer other advantages over metal because of the close tolerances to which they can be molded and the use of integral ribs and stops. Noise dampening provisions are not required as with metal trays; the operation of the plastic trays is smooth and quiet.

Crosley pioneered the use of the one-piece molded laminated phenolic frame joining the interior lining of the refrigerator to the exterior metal shell, and its use continues on the 1948 models. This is a frame shaped part 47% in. long and 32 13/16 in. wide. Its use allows complete elimination of exposed fastening means and provides an unbroken smooth surface which is easy to clean.

Ice cube separators are made of translucent blue polystyrene. The design of these parts is unique. They are slightly wedge-shaped and contain notches which interlock with an aluminum "backbone" and permit complete assembly of the grid without welding or riveting. In operation the ice easily breaks free from the polystyrene surface.

Angle type supports for shelves, baffles, and trays are molded from polystyrene. These supports add much to the appearance and are easier to clean than fabricated metal supports. They are designed with integral ribs and flanges and in spite of thin wall sections they are surprisingly strong.

# Multi-purpose parts

Aside from designing for plastics to gain such features as visibility, cleanliness, and thermal and electrical insulation, it is found that certain structural or functional parts can be more economically produced in plastics. This is particularly true when one part can be designed to replace two or more parts of other materials, such as lightly stressed two-piece metal stampings, or to perform two or more functions.

In general, the designs of molded refrigerator parts are made with 3/32-in. minimum wall thickness. "Box" sections are used whenever possible for rigidity. When feasible, stiffening ribs are two-purpose, serving also as material "flow" ribs.

As a rule, plastics materials in refrigerator cabinets are either clear or in one of the many shades of white. When white is specified, Crosley indicates a color "range" to allow the molder some latitude in the procurement of materials. The use of reground material is also permissible except on those parts where extreme importance is attached to the finish.

Molded laminated phenolics for the larger struc-

tural parts are generally 0.075 in. thick, and where such finish is required a synthetic baked enamel coating is applied. The largest part of this type in the Crosley is the interior lining of the main door. Again this plastic piece is a multi-purpose part. It performs the following functions:

1. Completes the box section of the door, adding structural rigidity.

2. Provides thermal insulation as it is a nonconductor of heat from the outer edge into the interior.

3. Provides structural support for the Crosley "Shelvador" food storage racks which are mounted on the door.

4. The outer edge is molded with a bead which retains the door sealing gasket.

5. It is decorative and adds to the eye appeal of the finished unit.

### New models - new ideas

No attempt is made to forecast the future of refrigerator design and the place that plastics will find in this field. Improvement in the materials themselves will dictate the rate of growing usage. Improvements in strength, particularly impact strength, greater dimensional stability, and more reduction of cold flow are desirable; such achievements will promote still further applications.

MATERIAL	No. of	TOTAL	FUN	CTIONAL	STRU	CTURAL	DECC	RATIVE		RMAL LATION		TRICAL LATION
MATERIAL	PARTS	WEIGHT	No.	WGT.	No.	WGT.	No.	WGT.	No.	WGT.	No.	WG?
POLYSTYRENE	38	8.979	29	8.135	8	.840	1	.004				,
LAMINATED FABRIC PHENOLIC	21	8.788			2	8.660				.070	11	.058
LAMINATED PAPER PHENOLIC	13	.179			4	.150					9	.029
METHYL METHACRYLATE	2	.155					2	.155				
PHENOLIC	3	.123							27		3	.123
UREA	12	.045			12							2 16 %
CELLULOSE ACETATE	3	.015									3	1
	92	18.284	29	8.135	26	9.695	3	.159	8	.070	26	.225
TOTALS				44.493%		53.024%		%698		382%		1.230%

# mmoumcim the new Plaskon range of 17 standard wrea colors

# as recorded by the U.S. Department of Commerce, National Bureau of Standards

Many advantages will accrue to the plastics industry as a result of this new standardization of commercial urea colors. Major among these benefits will be reduced inventory requirements; prompt shipments; greater efficiency in material manufacturing and molding; controlled color uniformity in molded products; and lower material costs.

These standardized urea colors have been developed in a cooperative program between the Commodity Standard Division of the National Bureau of Standards, U. S. Department of Commerce and the Plastics Material Manufacturers' Association. Plaskon Urea-formaldehyde Molding Compound in this new standard group bears the following identification numbers:

RED	0	a	0	0	0	0	0	0	0	0	0	0	5-219	MUP	71	BLUE	0	0	0	0						0	0	0	. 5-892	MUP	43
WHITE	0	0	0		0			0		6	6		5-245	MUP	01	IVORY	9					9			0	0			. 5-964	MUP	03
ORANGE	0	0	0	0	0	0	0	0	0	0	0	0	\$-354	MUP	58	BLUE													5-1096	MUP	42
YELLOW .																GREY .															
PINK																WHITE .															
ANTIQUE	IV	10	R	Y		0	4			9	0	0	5-447	MUP	32																
GREEN			0	0						0		0	S-467	MUP	12	MAROON															
BLUE		0	0	0		0					0	0	5-768	MUP	18	NATURA	L	0	0	0	0	9	0	0	9	0	0		5-10347	MUP	02
BLACK		*			*							*	5-849	MUP	60	PINK .		0	0		D	0	4	0	ů.	0	0	-	5-10381	MUP	24

Plaskon urea standard colors may be ordered by either one or both color number designations.

Note: The adoption of standard Plaskon colors will not restrict the production of other Plaskon colors.

Let us help you streamline your manufacturing and merchandising programs with Plaskon Urea-formaldehyde Molding Compound features and the new standard commercial colors. Plaskon is a THERMOSETTING molding material and is used widely because of its broad range of color, excellent dimensional stability, low water absorption and non-softening action when exposed to heat. Plaskon Molding Material has excellent electrical properties, will not corrode or tarnish and is not affected by common organic solvents or weak acids.

Experienced Plaskon Service Engineers and Plaskon\* Technical Service are available to assist in developing plans and programs to meet your specific needs.

\*Reg. U.S. Pat. Off.

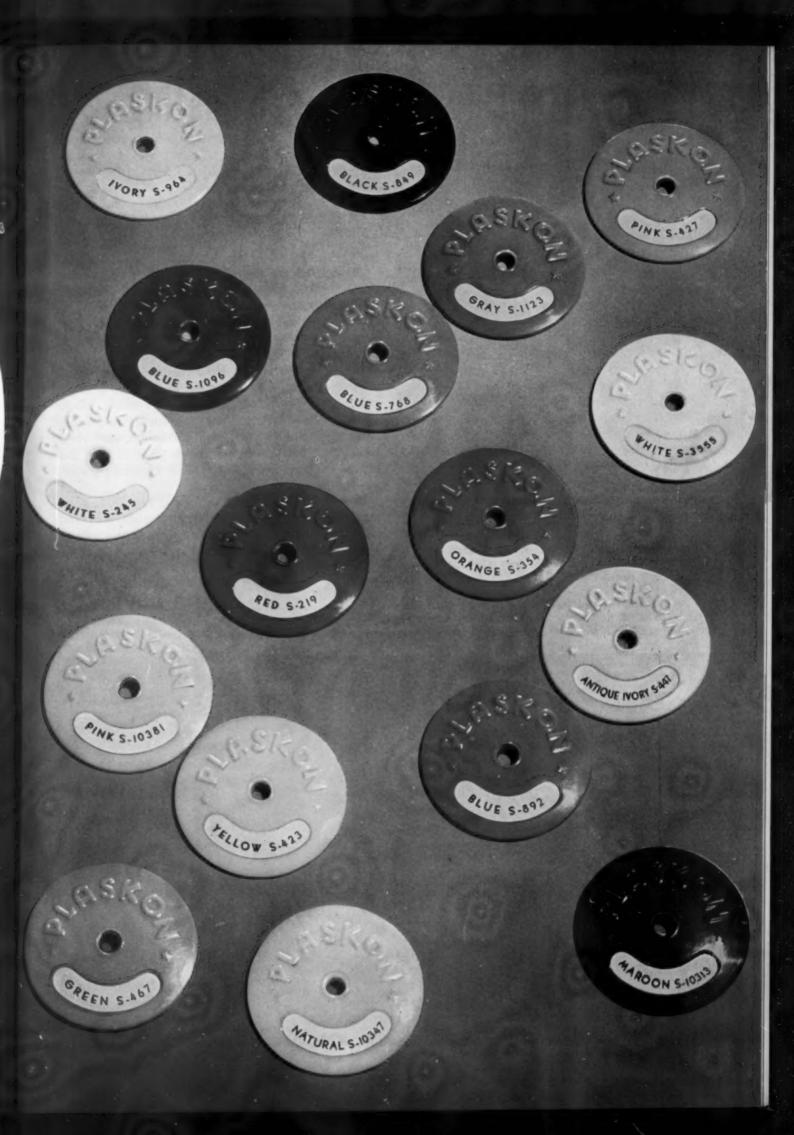
0

# PLASKON DIVISION LIBBEY . OWENS . FORD GLASS CO.

2121 Sylvan Avenue • Toledo 6, Ohio In Canada: Canadian Industries Ltd., Montreal, P. Q.

MOLDED COLOR

Note: The colors shown here approximate the new Plaskon 17 standard colors as closely as possible with printing inks. Actual molded samoles of each color are available on request



# Polystyrene in Centrifugal Casting

Plastic material offers advantages over wax in

producing metal castings by the "lost-wax" process

LTHOUGH the total volume of polystyrene utilized as molded patterns in the centrifugal casting of metals is relatively small, this little-known industrial application ranks of considerable importance because of the production advantages offered by the plastic over wax, the material traditionally employed in this process.

The use of polystyrene in centrifugal casting is in some respects analogous to that of sheet vinyl in the making of electrotypes (Modern Plastics, July 1946, p. 111), in that the plastic material itself serves an intermediate function in the production of an ultimate part made of metal, and in that wax is the material superseded in both instances. However, the processes involved are entirely different. Another point of dissimilarity lies in the fact that the vinyl patterns involved in electrotype production may be repeatedly re-used, whereas the injection molded polystyrene patterns employed in centrifugal cast-

ing are destroyed each time a casting is to be made.

The centrifugal casting of metals is a specialized process whose principal advantages are gained in the production of small metal parts involving intricate design and dimensional accuracy difficult to obtain by other methods. Metal components which may be made by conventional screw machine or punch press operations, or by relatively simple machining of a forged part, do not qualify for efficient production by centrifugal casting. However, there are many types of metal parts for which the process is ideal, as was demonstrated during the war, when centrifugal casting received much impetus from the urgent demand for high-precision ordnance pieces, electronic components, etc.

In centrifugal casting of brass, bronze, carbon steels, high alloy steels, and other metals, it is first necessary to produce an exact replica of the part to be made. This master pattern, or as many of them

Polystyrene patterns are assembled and mounted on polystyrene bases with carbon tetrachloride employed as the adhesive. The parts in the center of the table are so large that each one forms a pattern for a single casting. The record changer spindle patterns at right, being smaller, can be attached in considerable numbers to a plastic post which is cemented to a base to form a "tree" pattern



as size permits, is placed in a steel enclosure or flask and the ultimate mold material poured around it. After a drying procedure which hardens the mold around the pattern, the flask is transferred to a high-temperature oven where the master pattern is melted and burned out of the cavity. The mold is then mounted in the casting machine, where the molten metal is introduced into the cavities by means of centrifugal force.

# Wax patterns easily damaged

In the so-called "lost-wax" process, wax is the material commonly used for the master patterns. Although wax patterns may be produced in low cost molds, this material has a number of disadvantages at later stages of the process. The most serious is the fact that the easily damaged wax patterns must be handled with extreme care to avoid chipping or breakage prior to assembly of patterns for investment. It is also necessary to "baby" the wax pieces in joining them for spruing, to avoid bending or breakage. In addition, close temperature and humidity control is vital in working with wax patterns to maintain close tolerances and prevent warpage.

### Close tolerances, intricate coring

The use of molded polystyrene patterns in the centrifugal casting process permits close tolerances and extremely intricate coring in the finished casting. The plastic patterns require no pampering, but may be tossed into a box until time for use. Neither do they present the problem of moisture absorption and possible dimensional change which would affect the accuracy of the finished casting. Polystyrene is favored over other plastics for this process because it is economical, easily molded on standard injection equipment, and can be removed completely from the mold during the "burning out" operation, leaving no residue.

Illinois Precise Casting Co., 613 West 16th St., Chicago, is one of the relatively few firms which has had extensive experience with polystyrene patterns in centrifugal casting. During the war, the company turned out numerous military items through this process, including cocking forks, sight leaf slides for the 30 cal. machine gun, and torpedo and sea mine components. Among the civilian items which have been or are now being produced by this firm, and in which polystyrene patterns are used, are small die inserts, sewing machine parts, record changer spindles, cams, gear racks, small industrial machinery parts, and a variety of electronic components.

Robert J. Harvey of this company states that polystyrene enables his firm to produce intricate centrifugal castings and maintain close dimensional tolerances. The high tolerances attained in the final casting reflect an accuracy of plus or minus 0.002 or 0.003 in. held in the plastic master patterns. Because of the exceptional accuracy required in the plastic



Assembled plastic patterns are positioned in stainless steel flasks whose rubber bases are sealed in place with wax. Flasks are then placed on vibrating tables (above) and investment material is poured in the top. The rapid agitation of the flasks works material closely around parts

molding, Illinois Precise Casting Co. prefers to mold its own patterns, maintaining close supervision over temperatures and cycles to minimize the possibility of off-standard pieces which might cause rejection of metal castings later.

There is no important difference between the die sets used in this work and those usually employed in commercial injection molding. Gates, however, are kept ample, since they must allow rapid filling of cavities and maintenance of adequate pressure for accurately dimensioned pieces. Another point dictating use of sizable gates is the fact that later in the production cycle, the same gate must serve for entrance of the molten casting metal into mold cavities. Steel dies are usually used for producing the plastic master patterns, although on short runs the company has successfully employed bronze injection dies.

In making the injection dies, it is customary to work from a print or pattern of the desired casting and to machine the original cavities. Hobbing is employed only to a limited extent. Ordinarily, the die is constructed with several inserts which aid in accomplishing the desired degree of accuracy. If the part to be cast is so complicated that the plastic pattern cannot be molded in one shot without expensive tooling and provision for complex core withdrawal,



After a drying period during which investment material solidifies around the polystyrene pattern, the flasks are placed in a gas-fired oven. Temperatures ranging from 1300 to 1400° F. literally burn the plastic out of the mold. The worker above is removing evacuated mold from oven. It then goes to centrifugal casting machine to receive metal

the piece may be molded in two or more parts which are cemented together to form the pattern for the ultimate casting. In making up die sets for use in this process, due allowance must be made not only for the shrinkage of the plastic pattern, but also for the secondary shrinkage which occurs later, after the casting of the metal part.

If the desired die cavity is difficult to machine, it is sometimes easier first to machine a mating male part in steel. This piece is then secured in a steel box which is mounted on a small hand press so that polystyrene may be injected around the part. Removal of the male model leaves a plastic pattern of the cavity itself, from which a steel die cavity may be centrifugally cast by following the same routine used in casting other items by means of this process. Considerable "cutting and trying" is required on some jobs before the final casting meets all specifications.

Clear Lustron and Styron are the materials currently used by Illinois Precise Casting in its centrifugal casting program. On occasional pieces involving heavy sections, Styramic has been used; this polystyrene chlorinated diphenyl compound molds with less shrinkage, but its higher cost rules it out except for special cases. Either clear or dyed polystyrene can be used in this work (preferably the former), but pigmented material is avoided because it tends to leave a residue in the casting mold when the plastic patterns are burned out.

# Larger molding cycle used

Illinois Precise Casting Co. produces its plastic patterns on a 2-oz. H.P.M. horizontal injection molding machine, using Dow-Corning mold release fluid. A careful check is constantly kept on plastic temperature, length of cycle, cooling, and dimensions of the finished patterns. In some instances, critical dimensions are gaged by micrometer directly at the molding press. Castings are generally cooled in water immediately upon removal from the press. Cooling fixtures are employed on about one-third of the patterns.

Because of the high dimensional standards required, the tendency is to use a longer cycle than is customary in commercial molding practice. Pressure is maintained while each shot is chilling to guard against shrinkage, with a temperature of from 400 to 480° F. on the plasticizing chamber. Molded parts are clipped off just above the gate preparatory to subsequent operations.

# Castings assembled in trees

Using carbon tetrachloride as a cementing agent, de-gated castings are usually built into a "tree" or cluster which is to shape the final mold for the all parts. Foundation of the cluster is a hollow porystyrene base or button to which a molded post or support of the same material is cemented. Out from this trunk-like support branch the cemented plastic patterns. Their arrangement is determined by the particular casting requirements involved and by which parts of the finished casting are to have the most nearly perfect surfaces. If the plastic patterns are relatively long and thin, they may be attached in an upright position around the top surface of the plastic button. No central trunk or runner is required in this case. If a part is relatively large, a single unit, properly mounted, forms the finished pattern and no cluster is assembled.

After the "tree" pattern is built, the complete assembly is washed to remove any traces of mold release fluid adhering to the plastic parts. Then a rubber base is slipped over the bottom of the pattern and an asbestos-lined steel flask, open at the top, is placed over the entire tree. The joint at the bottom, where the flask meets the pattern, is sealed with wax.

### Silica mixture poured over tree

Flasks are mounted on vibrating tables where the investment material, consisting of fine silica in a silicate binder, is poured into them. Rapid agitation of the flasks insures that the material works closely around every part of the plastic tree, eliminating

porosity and producing a firm investment around the pattern. After several hours on the tables, the flasks are removed and dried for a few days in gasfired ovens at a temperature of 110 to 120° F. During the drying period, the molding material surrounding the plastic pattern hardens.

### Patterns burned away

Having served their purpose, the plastic patterns must next be removed from the mold before the final metal casting can be made. This operation is performed by racking the flasks in gas-fired ovens where temperatures ranging as high as 1300 to 1400° F. burn out all traces of the plastic pattern. Molds are held at this heat for 15 or 20 min., permitting the plastic to melt and vaporize completely. An exhaust fan vented to the outside carries off the residue resulting from this operation. At the end of the burning out process, the completely clean cavity is ready to receive the casting metal.

At Illinois Precise Casting, a typical casting unit

consists of an ECCO high-frequency induction converter for melting the casting metal, used in conjunction with two casting machines. The crucible in which the bars of casting metal are melted rests directly in the casting machine. Without being permitted to cool, a flask is transferred from the burnout furnace to the casting machine and so positioned that the feedhole is directly in line with an orifice in the crucible. The casting machine then begins to rotate at 250 to 350 r.p.m., creating centrifugal force which transfers the metal from the crucible into the cavities and maintains pressure while the metal solidifies.

At the end of each casting cycle, the flask is removed and allowed to cool overnight, after which the investment material is broken free and the released castings removed from the stainless steel flask, de-gated and sandblasted to remove any investment material or scale. Each time the casting cycle is repeated, another tree or pattern of plastic originals is destroyed.

A variety of patterns and the resulting parts which were produced by the centrifugal casting process. A 2-oz. injection press was used to make the plastic patterns. In back row, right, are a large pattern and the metal casting for electronic equipment produced from it. The eight-cavity cluster and its metal replica consist of a special part required in nylon hosiery manufacture. Other parts or patterns include assorted pawls, racks, cams, and record changer and governor parts



# Phenolic Improves Jet Pump

THE degree of perfection to which a jet pump functions is almost completely determined by the design and precision manufacture of the hydraulic jet assembly with which the pumping system is equipped. It was only natural therefore, that Johnston Pump Company engineers should lay greatest stress on these parts when they recently restyled their line of jet pump water systems, known in the pump field as Johnston Aquamatics.

Upon completion of the new hydraulic jet design, a production problem arose. The new system worked perfectly in test models, and achieved a greater efficiency of operation than was obtainable with similar pumping systems. On a production basis, however, costs were out of line. Experience with various materials for jet nozzles and the interior of the Venturi throats had showed that one special metal alloy was most satisfactory. To use this material for the entire throat of the Venturi in the new jet was not only too costly from a material standpoint, but required too much machining time because of the shape. Furthermore, each nozzle had to be matched and carefully aligned to each throat. Variations as slight as 0.005 in. in bores and alignment affected the efficiency of the unit.

Consequently, a production method was sought

Cast phenolic resin makes sleeve and Venturi tube a homogeneous unit. A machined groove locks throat unit in position



which would not only eliminate the ills of misalignment, etc., but would lower production costs as well. A plastic material not only furnished the answers to the production problems and costs, but was also lower in cost. This three-in-one answer was found in a Durez phenolic casting resin used in combination with a simple tube of the desired metal alloy for the Venturi throat. With this combination it was no longer difficult to keep nozzle and throat in alignment, and throat machining costs were greatly reduced. Furthermore, the entire assembly was lighter in weight, an advantage in handling and in shipping costs.

# Casting holds metal sleeve

An examination of the cutaway illustration of the Venturi and jet section of the Aquamatic system reveals the new construction. The method of producing the Venturi is relatively simple, but interesting. The exterior metal pipe sleeve is coated inside to prevent attack by the acid accelerator in the Durez casting resin. A precision-machined mandrel, designed in three sections, gives the desired form to the resin. With the metal alloy tube in place on the mandrel, this assembly is placed within the pipe sleeve and the liquid phenolic casting resin is poured in. When the resin hardens and cures, the sleeve. cast resin, and tube become a homogeneous unit. It is, of course, a simple matter to disassemble the mandrel to remove it from the sleeve. Patents are pending on this process.

It may be noted from the photograph that the inside of the pipe sleeve has a small machined groove at one point. This is to lock and hold the cast resin and alloy throat unit in correct position. As far as the internal design of the cast resin part is concerned, the normal shrinkage of 0.002 in. per in. is taken into consideration in the design of the mandrel around which the resin is formed. This slight shrinkage around the special alloy tube is, of course, advantageous.

Many of the attributes of the special alloy are inherent in the Durez resin. Most important of these is resistance to wear and to corrosion. The smoothness and gloss of the wearing surface of the phenolic resin are determined by the finish of the mandrel and may be governed accordingly. The cast part may be machined should such machining be required.

From an engineering viewpoint, jet design is really an art. Full credit deservedly goes to the engineers who have so successfully restyled Johnston Aquamatics through the application of phenolic casting plastic.

# To build your markets bigger

You may already have seen this advertisement. Published in a recent issue of TIME, it is one of a series to help you sell products made of BEETLE\* and MELMAC.\*

Now we plan to work harder than ever to help develop new applications...new markets...new profits...for colored thermosetting plastics. And we count on working with you. Count on us ... call on us ... for marketing and technical aid.

If you have an idea for a new application, check it against designing, molding, and marketing data we have for you. It's the best way to make a market without making a mistake. (For example, there may be other applications which can be developed as successfully as Melmac Tableware.)



# "This won't hurt you, darling!"

and darling won't hurt the BEETLE plastic seat





### BE SURE YOU GET THE DIFFERENCE

Two toilet seats may look alike at first glance... but the one made of BEETLE Plastic will look good year after year and will remain sanitary, smooth and comfortable. To make sure of long service, look for informative labelling or ask for the facts about the plastics products you buy.

QUESTIONS PLEASE! Our technical staff will be glad to help you solve problems in plastic application and design. And if our materials do not exactly fill the bill, we will cheerfully direct you to the right sources. American Cyanamid Company, Plastics Department, 32 Rockefeller Plaza, New York 20, New York.





AMERICAN Gyanamid COMPANY

PLASTICS DEPARTMENT
32 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Our Tom-Boy doesn't take too kindly to scrubbing and brushing. But the Beetle plastic seat she is standing on is always *easy* to clean... and it is mar-resistant even under unusually rough treatment.

Other good practical reasons why BEETLE plastic seats are being used in more and more bathrooms:

Their surfaces (white or colored) remain lustrous.

Though strong and durable, they are not heavy enough to break or crack the toilet bowl when dropped or slammed.

They are unaffected by common solvents and will not catch fire or melt, even under a burning cigarette.

They have no "splice" or jointing to crack open.

BEETLE Plastic is also ideal for many other household articles from lighting fixtures to stove handles. For, in addition to its many other advantages, BEETLE Plastic is odorless, tasteless, and has excellent electrical properties.

BEETLE\* plastics—urea-formaldehyde thermosetting molding compounds. MELMAC\* plastics—melamineformaldehyde thermosetting molding compounds, industrial and laminating resins. URAC\* resins—ureaformaldehyde thermosetting industrial resins and adhesives. MELURAC\* resins—melamine-urea-formaldehyde thermosetting reals adhesives and laminating resins. LAMINAC\* resins—thermosetting objecter resins.

# New ALBUM-LENGTH RECORD PL



FOR THE BEST IN MOLDED PLASTICS

# PLAYER BY PHILCO

# with Molded Plastic Cabinet by GENERAL INDUSTRIES

Among the newest developments in the radio-phonograph industry is the PHILCO Album-Length Record Player. Designed for the Columbia long-playing microgroove records of Vinylite plastic, it affords 45 minutes of continuous entertainment from a single record.

The attractive, streamlined cabinet which houses this unit is typical of the custom molded plastic parts produced by The General Industries Company, a leading supplier of PHILCO cabinets. Single-piece base and hinged cover are molded of Bakelite in General Industries' battery of 650-ton compression presses.

Whether your plastic products are simple control knobs, large intricate cabinet assemblies, or somewhere in between, you'll find it worthwhile to investigate the cost-cutting, quality-building advantages of having them custom molded by General Industries. Backed by 25 years of practical molding experience, General Industries' competent engineering staff is ready to serve you. Write us today.



Representatives in Buffalo, Chicago, Philadelphia and Detroit

With Plastic.. This is Safe!

But.. Don't Try It with China!

129,976 more pieces of this Devine Ware molded of plastic tableware MELMAC\* are now serving Pentagon patrons!

\*Claremont Cotton Flock-Strengthened!

Tests with Devine Tableware over a period of time have proven to the Army staff in charge of purchases for the Pentagon Building Cafe-terias that these tough Melmac-molded plastic service sets are . . . stronger than heaviest china – virtually unbreakable – lightweight – more desirable—and mest economical! For that reason there are now 130,000 units-plates, cups, saucers, trays, etc.—now serving Ponta-gon patrons!

Devine Ware has the feel and appearance

of fine china; and the amazing chemical and physical properties of a tough plastics resin — Melmac. Its rugged strength lies in the filler used—CLAREMONT chopped cotton fabric. This Clarement filler gives it the sinews that will

Clarement filler gives it the sinews that will make the end use of the formula wear... and wear... You'll be all set, too, with whatever strength factors your compound requires when you select one of the Clarement fillers (available in four types: flock, thread, chopped fabric and cord). All are carefully graded, clean, uniform in size and processed to your special needs. A list of your specifications will bring you samples for laboratory test runs. Inquiries invited!

CLAREMONT

FLOCK THREAD FABRIC CORD

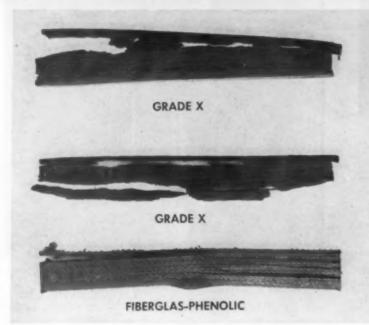
IS THE HEART

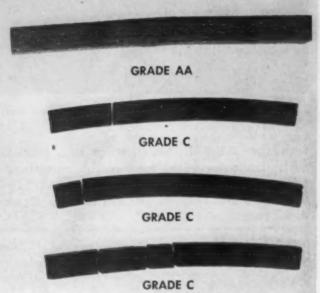
EMON WASTE MANUFACTURING CO.

"The Country's Largest Manufacturer of Flock" CLAREMONT, N. H.

# TECHNICAL SECTION

DR. GORDON M. KLINE, Technical Editor





1 - Condition of laminates exposed to 175° C. for 6 months

# Thermal Effects on Flexural Strength of Laminates

by Patrick Norelli\*

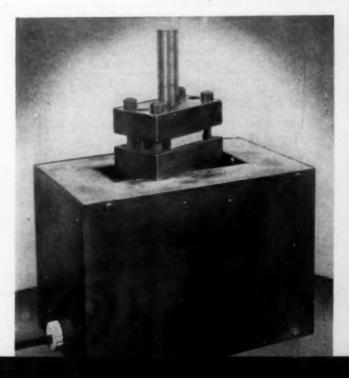
aviation industries is the question of better plastic materials for use over a wide range of temperature. In order to determine the heat resistance of various commercial phenolic laminates at temperatures from —55 to 200° C. an investigation as described herein has been carried out. As well as determining the relative attributes of various laminates, this investigation shows that the laminates are actually improved by thermal exposure and suggests the possibility of heat treating them to improve physical properties.

Two test series were run to find the flexural

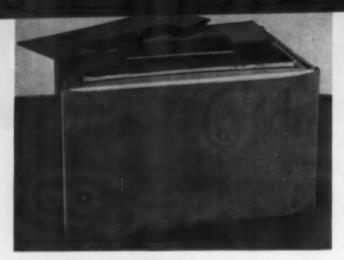
strength of commercial laminates under various thermal conditions. In the first series, flexural strength tests were made at room temperature after samples had been subjected to long thermal exposure. In the second series, samples were tested while held at various elevated temperatures.

All tests for both phases of this investigation were made on a 10-ton Amsler testing machine using the 1000-lb. scale, and were conducted in accordance

2 — Equipment used to obtain elevated temperature in flexural tests



\*Westinghouse Research Laboratories, East Pittsburgh, Pa.



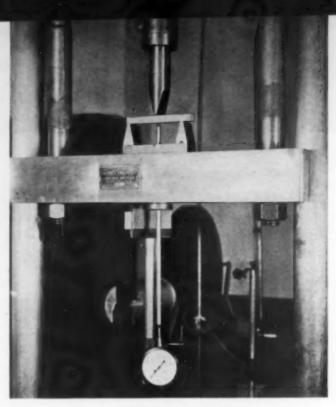
3 - Equipment used to obtain low temperatures in flexural tests

with the A.S.T.M. tentative method \*D650-42T. The laminates tested for flexural strength after exposure over periods of 6 months and 1 year to temperatures of 25, 65, 100, 120, and 175° C., were as follows:

NEMA grade	Filler	Resin
C	Coarse-weave cotton fabric	Phenolic
X	Kraft paper	95
AA	Asbestos cloth (fabric)	27
-	Fiberglas fabric	25

The results of this first series of tests are shown in Tables I and II. At the end of 6 months, Grades C and X laminates in the 175° C. oven were found in a charred condition and broke on handling; Grade AA and Fiberglas samples retained 35 and 15% of their initial flexural strength, respectively. The comparative conditions of the samples exposed to 175° C. for 6 months are shown in Fig. 1, which is on page 121.

In the second series of experiments, laminates were tested for flexural strength after being brought



4 - Equipment used for determining flexural strength

to temperatures of —55, —20, —0, 25, 75, 150, and 200° C., 1 hr. at these temperatures being allowed to permit thermal equalization. The commercial laminates tested were as follows:

NEMA grade	Filler	Resin
AA	Asbestos cloth (fabric)	Phenolic
X	Kraft paper	22
XX	Absorbent paper	Cresylic acid
LE	Fine weave cotton fabric	99
C	Coarse weave cotton fabric	Phenolic
_	Fiberglas fabric	Cresylic acid
	Asbestos cloth (fabric)	Melamine

Table I.—Thermal Exposure Effects on Flatwise Flexural Strength of Laminates'.

Exposure condition	G	rade X	Gr	rade C	Gre	ide AA	Fibergla	s-phenolic
	Flexural strength	Comparison with initial	Flexural strength	Comparison with initial	Flexural strength	Comparison with initial	Flexural strength	Comparison with initial
	p.s.i.	%	p.s.i.	%	p.s.i.	%	p.s.i.	%
Initial strength	24000	100	17000	100	24000	100	32000	100
6 months at 25° C. 12 months at 25° C.	28000 26200	116 109	16500 19300	97 113	23000 25500	96 106	30500 31600	95 99
6 months at 65° C. 12 months at 65° C.	32000 31200	133 130	18500 18600	109 109	25600 27500	107 115	36400 36500	114 114
6 months at 100° C. 12 months at 100° C.	29000 29000	121 121	13000 11000	77 65	26100 24500	109 102	36000 35500	113 111
6 months at 120° C. 12 months at 120° C.	24000 25600	100 107	8000 5160	47 30	23100 22100	96 92	32000 · 25000	100 78
6 months at 175° C.	0	0	0	0	8500	35	4600	14

<sup>\*</sup> Test specimens 5 by 15 by 15 in.; A.S.T.M. Method D650-43T; 8:1 span-depth ratio; all tests performed at room temperature. 5 By extrapolation; not actual test data.

Table II. - Thermal Exposure Effects on Edgewise Flexural Strength of Laminates\*.

Exposure condition	Gr	ade X	G	rade C	Gra	de AA	Fibergla	s-phenolic
	Flexural strength	Comparison with initial	Flexural strength	Comparison with initial	Flexural strength	Comparison with initial	Flexural strength	Comparison with initial
	p.s.i.	%	p.s.i.	%	p.s.i.	%	p.s.i.	%
Initial strength	23600	100	17500	100	23000	100	35600	100
6 months at 25° C. 12 months at 25° C.	29000 25700	123 109	19300 18300	110 105	24400 25000	106 109	34000 38500	96 108
6 months at 65° C. 12 months at 65° C.	33000 32900	140 140	16200 18000	93 103	29500 26400	128 115	45800 46100	129 129
6 months at 100° C. 12 months at 100° C.	25900 26000	110 110	10950 11000	63 63	27800 25500	121 111	47500 44000	133 124
6 months at 120° C. 12 months at 120° C.	23500 23500	100 100	7000 5470	40 31	23900 21500	104 94	40000 36000	112 101
6 months at 175° C.	0	0	0	0	8000	35	6600	19

<sup>\*</sup> Test specimens 5 by  $\frac{1}{12}$  by  $\frac{1}{12}$  in.; A.S.T.M. Method D650-42T; 8:1 span-depth ratio; all tests performed at room temperature. b By extrapolation; not actual test data.

The elevated temperatures were attained by means of the small, rectangular electrical resistance furnace shown in Fig. 2, page 121. A dry ice and alcohol bath in the rectangular vessel shown in Fig. 3, was used for subnormal temperatures. Both furnace and cooling chamber fitted completely around the flexural test fixture, but opened at top and bottom to permit loading and deflection measurements, respectively. Deflections were measured by means of a dial gage placed midway under the flexural test fixture, as shown in Fig. 4. Figure 4 also

illustrates the required setup for the room tempera-

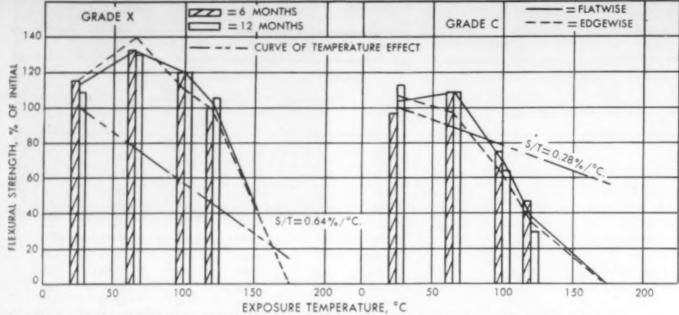
Results of this second series of tests at sustained temperatures are compiled in Tables III, below, and IV, page 125.

Five specimens of each laminate for each temperature and time were used. Of the five, three were given flatwise flexural tests and two were given edgewise tests. An air-conditioned room was used for the 25° C., exposure and forced-draft electrically heated ovens for the other exposure temp-

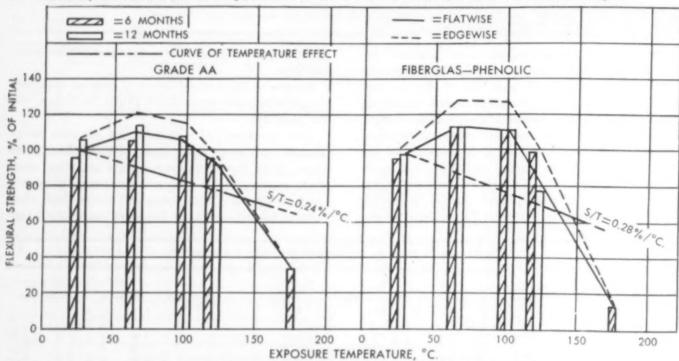
Table III.—Thermal Effects on Flexural Strength of Laminatesa.

Temperature of test	Direction of test <sup>b</sup>	Grade	X	Grade	XX	Grade	LE	Grade	C	Grade	AA	Fibe phen	erglas olic		estos- mine
		Flexural	Comparison with 25° C.	Flexural	Comparison with 25° C.	Flexural	Comparison with 25° C.								
°C.		p.s.i.	%	n s.i.	%	p.s.i.	%								
~55 -55	FW EW	36000 38300	153 160		137 130		140 135	19300 20400		35500 31400		37400 39700	115 111		133 139
-20 -20	FW EW	33100 33900	142 143	21400 23000	132 128	20200 22600	120 122	19100 20100		27200 23200		37600 41500	115 115	28700 28100	119 117
0	FW EW	30700 33500		18200 21500	117 120	20600 20200	122 110	20400 20000		23200 25800		35000 36200	107 101	23500 24400	98 102
25 25	FW EW	23300 23700		16100 17900		16800 18400		17090 17500	100 100	23800 23000		32600 35900	100 100	24000 23800	100 100
75 75	FW EW	16900 18600		13600 14200	-	13500 12900	80 70	13100		19300 18500	-	28200 31000	87 87	21600 20500	90 86
150 150	FW EW	***						9700 9950	-	15800 17100		17000 16900	52 47	18400 19500	76 82
200 200	FW EW		• •		• •			8400 8200	-	17600 15200		16800 16100		17700 18300	73 77

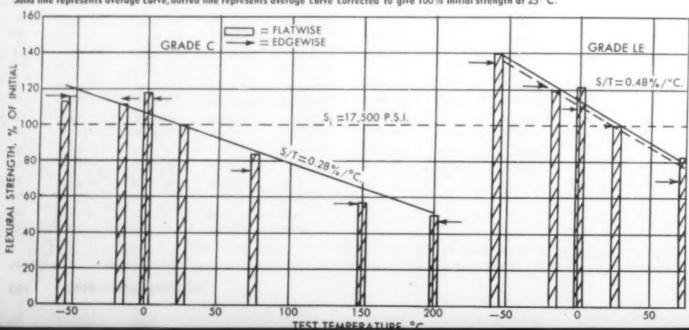
<sup>\*</sup> Laminates conditioned for 1 hr, at test temperature before testing. h FW-flatwise; EW-edgewise.

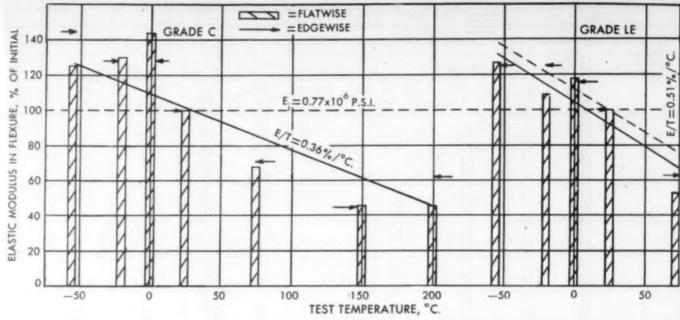


5 — Thermal exposure effects on flexural strength at 25° C. of Grade X and C laminates, based on 100 for initial strength



6 (above) — Thermal exposure effects on flexural strength at 25° C. of Grade AA and Fiberglas-phenolic laminates, based on 100 for initial strength. 7 (below) — Temperature effect on flexural strength of Grades C and LE laminates. Solid line represents average curve, dotted line represents average curve corrected to give 100% initial strength at 25° C.





Solid line = average curve

Dotted line=average curve corrected to give 100% initial modulus at 25°C.

8 — Temperature effect on flexural modulus of elasticity of Grades C and LE laminates

eratures. There was no control of relative humidity in the test room.

### Analysis of results

For the purpose of analyzing the results of the two series of thermal tests the graphs shown in Figures 5 to 14 have been prepared from the data presented in Tables I to IV. Figures 5 and 6 represent the first series in which various laminates

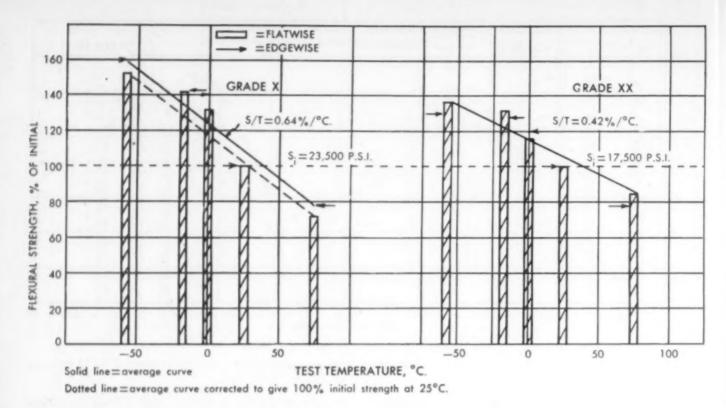
were tested after 6 months and 1 year exposure periods, respectively. The straight line temperature effect curves are superimposed from the curves in Figs. 7 to 14, giving results of second test series. Figures 7 to 14 present data from Tables III, page 123, and IV on tests at elevated temperatures.

On all of these curves, columns or arrows represent the actual test values. Since the difference between exposure for 6 and 12 months is negligible,

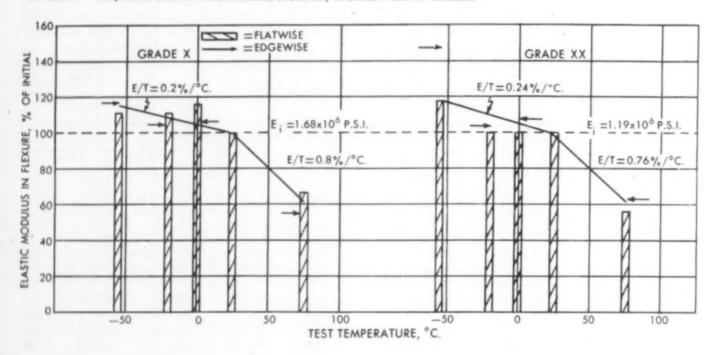
Table IV. - Thermal Effects on Flexural Modulus of Elasticity of Laminates'.

Temperature of test	Direction of test <sup>b</sup>	Grade	X	Grade	XX	Grade	LE	Grade	C	Gra	de AA		rglas- nolic		estos- ımine
		Modulus of elasticity	Comparison with 25° C.												
°C.		106	%	10°	%		%		%	10°	%	10°	%	10°	%
		p.s.i.		p.s.i.		p.s.i.		p.s.i.		p.s.i.		p.s.i.		p.s.i.	
-55	FW	1.83		1.43		1.16		0.96		1.92		2.75	113		129
-55	EW	2.03	117	1.74	148	1.08	125	1.28	145	2.05	153	2.63	109	2.61	156
-20	FW	1.84	111	1.16	98	1.01	109	0.96	125	1.75	107	2.26	98	2.01	115
-20	EW	1.81	105	1.23	104	1.08	125	0.98	126	1.69	125	2.16	90	1.77	106
0	FW	1.92	116	1.18	99	1.10	118	1.11	144	1.67	102	2.64	107	1.94	112
0	EW	1.83		1.28		1.00		0.99		1.66		2.60	108	1.77	106
25	FW	1.65	100	1.20	100	0.91	100	0.77	100	1.64	100	2.47	100	1.74	100
25	EW	1.73		1.18		0.86		0.77		1.34		2.41			100
75	FW	1.10	67	0.68	57	0.51	55	0.53	68	1.20	73	2.47	100	1.42	82
75	EW	0.96		0.76		0.53		0.55		1.14		2.06		1.13	68
150	FW							0.35		0.90	56	1.32	54	1.19	69
150	EW							0.35		1.07		1.45		1.25	75
200	FW							0.35	46	0.98		1.34		1.33	77
200	EW							0.48		0.95		1.40		1.26	76

<sup>\*</sup> Laminates conditioned for 1 hr. at test temperature before testing. b FW-flatwise; EW-edgewise.



9 (above) — Temperature effect on flexural strength of Grades X and XX laminates 10 (below) — Temperature effect on flexural modulus of elasticity of Grades X and XX laminates



average curves are drawn for the values on Figs. 5 and 6. Similarly in the short period tests edgewise and flatwise values are nearly the same with the possible exception of NEMA grade AA, Fig. 12, and are therefore also represented by an average curve.

For convenience the slopes of the straight line curves are calculated in terms of percent of initial strength per degree Centigrade, and they are designated as the thermal coefficient of elasticity (E/T) and the thermal coefficient of bending stress (S/T).

An additional physical property, that of resilience,

became evident in the second series of tests. Resilience of a beam in cross bending is proportional to  $S^2/E$  which is readily obtained from Tables III and IV or from the curves representing these values. Therefore, arbitrarily choosing the value  $S^2/ET$  as the thermal coefficient of resilience, Table V was made up to compare the resilience of the laminates.

### Summary of findings

Figures 5 and 6. Variation in flexural strength is nearly equivalent for 6 or 12 months exposure:

Table V. - Thermal Coefficient of Resilience of Laminates\*.

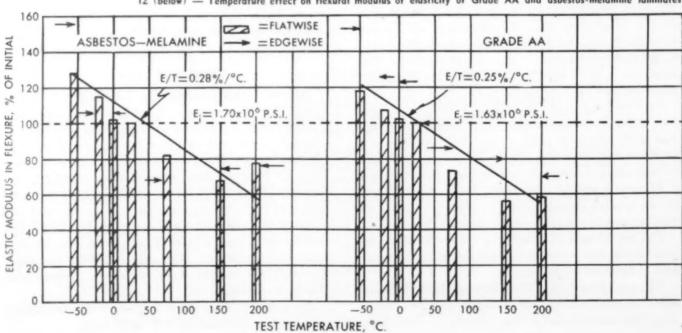
Type of laminate	S/	T	(S/	r)°	E/T (Av	erage)	S <sup>2</sup> /ET (A	S*/E	
	p.s.i./° C.	%/° C.	p.s.i./° C.	%/° C.	p.s.i./° C.	%/° C.	p.s.i./° C.	%/° C.	p.s.i.
Grade AA	56	0.24	3140	0.06	4150	0.25	0.94	0.28	330
Grade X	150	0.64	22500	0.41	8400	0.50	4.20	1.28	330
Grade XX	73.5	0.42	5410	0.18	5900	0.50	1.25	0.49	250
Grade LE	84	0.48	7090	0.23	3900	0.51	1.81	0.45	400
Grade C	49	0.28	2410	0.08	2750	0.36	0.88	0.22	400
Fiberglas-phenolic	98	0.29	9610	0.08	6000	0.24	1.60	0.35	460
Asbestos-melamine	56	0.24	3140	0.06	4750	0.28	0.66	0.21	310

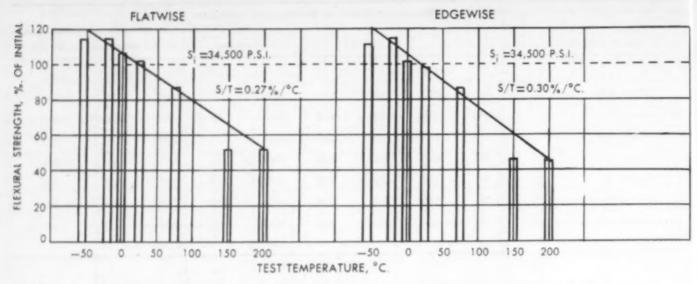
160 = FLATWISE GRADE A ASBESTOS-MELAMINE = EDGEWISE 140 OF INITIAL 120 5/T=0.24%/°C S/T=0.24%/°C. FLEXURAL STRENGTH, % S. = 23,500 P.S.I. S; =23,500 P.S.I. 100 80 60 40 20 200 -50 0 100 150 200 TEST TEMPERATURE, °C. Solid line = average curve

Dotted line = average curve corrected to give 100% initial strength at 25°C.

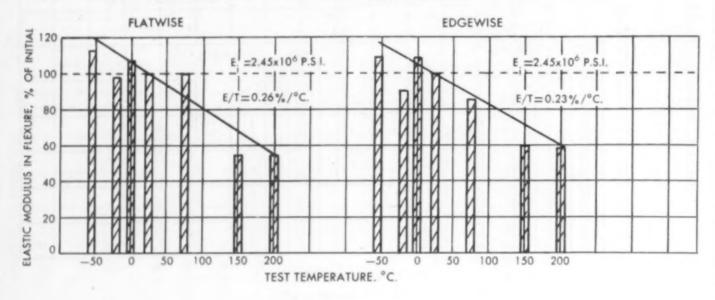
11 (above) — Temperature effect on flexural strength of Grade AA and asbestos-melamine laminates.

12 (below) — Temperature effect on flexural modulus of elasticity of Grade AA and asbestos-melamine laminates





13 (above) — Temperature effect on the flexural strength of Fiberglas-phenolic laminate 14 (below) — Temperature effect on flexural modulus of elasticity of Fiberglas-phenolic laminates



Grade X has twice the thermal deterioration rate of the other laminates. Improvement in flexural strength at exposure temperatures from 65 to 100° C. is substantial except in the case of Grade C. This amounts to 40% for Grade X, 30% for Fiberglasphenolic, and 20% for Grade AA.

Figures 7 and 8, pp. 124 and 125. Grade C laminate has better thermal stability than Grade LE. Thermal coefficient of bending stress (S/T) and thermal coefficient of elasticity (E/T) are lower for Grade C, indicating a lower rate of strength deterioration.

Figures 9 and 10, page 126. Grade XX laminate shows greater strength stability than Grade X; the two are nearly equal in elastic stability.

Figures 11 and 12, page 127. Asbestos-melamine and Grade AA laminate are approximately equivalent in thermal behavior.

Figures 13 and 14. The Fiberglas-phenolic laminate has good elastic and strength stability. However, the asbestos and cotton (Grade C) cloth laminate has been contained by the contained by the

nates have practically the same stability, except that Grade C cannot cover the same temperature range.

### Concluding remarks

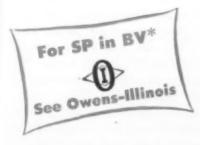
Although this investigation was begun to determine the heat resistance of several laminates, one of the results is to show that they are actually improved by thermal exposure for certain time-temperature cycles. Figures 5 and 6 appear to indicate that 65° C. is the most efficient heat treating temperature. Thus the idea of heat treating plastic laminates to improve their physical properties and the concept of a critical temperature is introduced. The existence of such a critical temperature in plastics and resins receives much support from literature covering the second order transition temperatures for these materials.

Referring to Figs. 5 and 6 again, if it is arbitrarily (Please turn to page 188)



Thermo Jug cap, life-size—volume-produced at low cost by Owens-Illinois, big makers of small plastics!

# "SMALL" PLASTIC?



\*Small Plastics in Big Volume

It can be as small as a tire valve cap or as big as the life-size Thermo Jug cap shown above. Within this range Owens-Illinois manufacturing facilities are outstanding. We are specialists in *small* plastics needed in *large* volume at *low* cost.

The tremendous resources available at Owens-Illinois have produced billions of small plastics for hundreds of industrial and home uses.

This experience and technical skill are ready to go to work on your plastics needs *now*. Call us for prompt service!

PLASTICS DIVISION

**OWENS-ILLINOIS GLASS COMPANY** 

TOLEDO I, OHIO . BRANCHES IN PRINCIPAL CITIES

# Manufacture and Use of Polyethylenimine in Germany\*

Polyethylenimine is of interest for application in the paper and textile fields. It has been produced since 1938 in Germany in an I. G. pilot plant at Ludwigshafen. Five to six tons per month were made in 1943 at a cost of 6 RM per kilogram. The plant was totally destroyed by an air raid in September 1944.

The monomer was prepared in the pilot plant by the following reactions:

1. Conversion of monoethanolamine to the hydrochloride with dry hydrogen chloride:

 Reaction of monoethanolamine hydrochloride with thionyl chloride, producing first a sulfite esterchloride and then chlorethylamine hydrochloride by loss of sulfur dioxide:

$$HCl \cdot NH_2CH_2CH_2OH + SOCl_2 \rightarrow HCl \cdot NH_2CH_2CH_2OSOCl + HCl$$

HCl·NH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OSOCl→

3. Treatment of chlorethylamine hydrochloride with sodium hydroxide to yield ethylenimine:

The manufacturing operations will be described in the above-mentioned three steps.

### Preparation of monoethanolamine hydrochloride

A shallow lead-lined acid-resistant kettle, fitted with a heavy duty plow-type agitator, was used as the reactor. Very pure (99½%) dry monoethanolamine was charged into the kettle, and dry hydrogen chloride was introduced slowly while the mass was agitated. The temperature was held below 30° C. by external cooling. During the reaction the liquid monoethanolamine was converted to the solid hydrochloride, the mass going through a heavy pasty condition. Usually no diluent or solvent was employed,

"This report is based on information contained in the following Publication Bord's reports: PB 485, "Miscellaneous chemicals, I. G. Parbenindustrie A.G., Ladwignshafen and Oppau," by J. G. Kern, B. L. Murray, and R. W. Sudhoff. PB 1576, "German chemical developments in textile finishes," by R. A. Piggree, PB 7416, "Synthetic fiber developments in Germany," compiled and edited by L. H. Smith, published by Textile Research Institute, Inc., 10 E. 404h St., New York 16, N. Y. PB 1444, "Ethylenimine," by Ulrich (in German). PB 12467, "German plastics practices," by J. M. DeBell, W. C. Goggin, and W. E. Gloor, published by DeBell and Richardson, Springfield, Mase. PB 48437, "Polyethylenimine and its use in paper making," by J. T. Thuratson.

although it was stated that ethylene dichloride in small quantities has been added at times to make the reaction more fluid. After completion of the reaction the solid hydrochloride was discharged from the reaction vessel and stored under dry conditions. The yield was almost 100% of theoretical.

# Preparation of chlorethylamine hydrochloride

A kettle similar to that used to make monoethanolamine hydrochloride is suitable. Glass-lined kettles also have been used at Ludwigshafen, but lead-lined equipment is considered better. The lead must be very pure (99.98% pure electrolytic lead). The kettle was charged with dry monoethanolamine hydrochloride and thionyl chloride was added slowly, holding the temperature below 20° C. This results in conversion of the solid starting material into the liquid esterchloride. Very little more than the theoretical quantity of thionyl chloride is required. The reaction is somewhat exothermic.

After preparation of the esterchloride, the temperature was raised to 30° C., resulting in liberation of gaseous sulfur dioxide and conversion of the esterchloride to the solid chlorethylamine hydrochloride. Heavy duty agitation was necessary to stir the mass through a thick pasty stage and then break up the solid product into a dry powder. The product was discharged and stored in dry air-tight containers. The product is highly irritating and the operators must wear gas masks and gloves while handling the product.

# Preparation of ethylenimine

A considerable excess of 30 to 32% aqueous sodium hydroxide over that theoretically required was charged into an agitated iron kettle, fitted as a still. Above the kettle was a column, a portion of which was filled with solid sodium hydroxide in stick form. This was provided to remove the last traces of starting material and intermediate products from the ethylenimine during the distillation step. The column delivered the ethylenimine vapor to an iron condenser, discharging into an iron receiver containing solid sodium hydroxide in stick form. The entire unit was gas-tight to avoid any liberation of the toxic and otherwise hazardous product.

Solid chlorethylamine hydrochloride or, preferably, the chlorethylamine hydrochloride dissolved in water at very high concentration was added gradu-

(Please turn to page 175)



d

# Tune in to Tenite

Attractive case of this portable radio is made of woven fabric laminated with clear Tenite and shaped in heated dies. Tenite imparts stiffness and moldability to the fabric, and gives it a tough, moisture-resistant "skin" that is lustrous and easy to clean. The finished article is lightweight and structurally strong, withstands hard wear without tearing, peeling, or chipping.

In addition to this use as a laminate, Tenite is a popular material for injection molding — as for the take-up spools and control wheels of this radio — and continuous extrusion. Tenite manufacturing processes are characteristically rapid, and involve few finishing operations. As a result, the use of Tenite often effects real savings.



Radio by Motorola, Inc., Chicago;
Tenite-laminated case by Woodall
Industries, Inc., Detroit; control
wheels and take-up spools
molded by Superior Plastics Div.,
Commonwealth Plastics, Inc.,
Chicago

Information regarding Tenite is obtainable through representatives located in Chicago, Cleveland, Dayton, Detroit, Leominster, Mass., Los Angeles, New York, Portland, Ore., Rochester, N. Y., St. Louis, San Francisco, Seattle, and Toronto, Canada; and elsewhere throughout the world from Eastman Kodak Company affiliates and distributors.

TENITE

an Eastman Plastic



PLAYPROOF TOYS FOR GIRLS AND BOYS

MOLDED WITH TOUGH CELLULOSE ACETATE

Suggested toy design by Carl Sundberg Sundberg & Ferar, Detroit, Mich

Sectional view showing easily assem-bled two-piece body and handle.

Designed to be molded from cellulose acetate, this shooting toy is doubly safe because of acetate's extraordinary toughness. The shaft of its rubber-tipped arrow won't crack or splinter. The rugged body and handle are resilient and shatterproof. Acetate's eye-appealing colors can't wear off.

That's why more and more of tomorrow's toys are being designed in cellulose acetate. There's far less loss from breakage in assembly, shipment, and handling in stores. Whenever toughness is a factor, acetate is the lowest priced thermoplastic available.

For details and suppliers' names, write:

HERCULES POWDER COMPANY

916 Market Street, Wilmington 99, Delaware

MOLDED IN CELLULOSE ACETATE FOR

Thin-walled Toughness Dimensional Stability Enduring Color & Finish Manufacturing Economy Safety in Use Lightweight

SUPPLIERS OF HIGH-QUALITY CELLULOSE DERIVATIVES FOR PLASTICS

CELLULOSE ACETATE . ETHYL CELLULOSE . NITROCELLULOSE

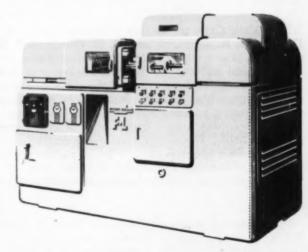
# 150 MORE SHOTS per day\*

The new, unique FELLOWS-LEOMINSTER "Speed-Flo" Cylinder with the "Taper-Tite" Separator brings this extra plasticising capacity. A new balancing of heat distribution increases capacity, in pounds per hour, 10 to 14%. Your operator can speed up the output rate to give 124 to 177 additional shots per shift. Think what this means in the multiplied number of pieces—and in extra daily profits. A new bulletin of Fellows-Leominster "Speed-Flo" injection molding equipment is now available. Write: The

Fellows Gear Shaper Company, Plastics Machine Division,
Head Office and Export Dept., Springfield, Vermont. Branch
Offices: 616 Fisher Building, Detroit 2; 640 West Town
Office Building, Chicago 12; 7706 Empire State Building,
New York I. New England Distributor: Leominster Tool
Company, Leominster, Mass.



injection molding equipment



\*Based on an 8-hour day, 2 ounces per shot on the 1-B-2 machine

# PLASTICS DIGEST\*

Abstracts from the world's literature of interest to those who make or use plastics or plastics products. Send requests for periodicals to the publishers listed

#### General

MECHANISM OF PLASTICIZATION IN PLASTICS. J. K. Craver. A.S.T.M. Bulletin No. 152, 90-3 (May 1948). A plasticizer operates by modifying the van der Waals forces within a resin. Some preliminary estimates of plasticizer compatibility and efficiency can be obtained by a study of the chemical structure, molecular weight, and related properties of the plasticizer. Much more work must be done along these lines before we can predict with very much accuracy, however. Laboratory determinations of compatibility, efficiency, permanence, and performance must still be conducted on each new plasticizer.

#### Materials

Lactic Acid Polymers. P. D. Watson, Ind. Eng. Chem. 40, 1393-7 (Aug. 1948). Modified lactic acid condensation polymers, developed in the Division of Dairy Research Laboratories, may be of interest to the coatings industry. The most useful of these products appears to be a modified polylactylic acid-fatty oil polymer, from which tough, water-resistant coatings may be formulated. Another class of resins is the metal polylactyl lactates derived almost entirely from lactic acid; these types of polymers may be used for protective coatings and decorative coatings.

Polymerization of m-Nitrostyrene. R. H. Wiley and N. R. Smith. J. Polymer Sci. 3, 444-7 (June 1948). m-Nitrostyrene, prepared from m-nitrocinnamic acid in 60% yields, was converted to polymers of low molecular weight in bulk and in solution with benzoyl peroxide, boron fluoride, and aluminum chloride initiators, and, in addition, in aqueous emulsion with persulfate initiator.

New High Capacity Cation Exchange Resin. W. C. Bauman, J. R. Skidmore, and R. H. Osmun. Ind. Eng. Chem. 40, 1350-5 (Aug. 1948). High capacity and excellent chemical stability are the chief attributes of Dowex 50, a new cation exchange resin of the sulfonated hydrocarbon type, which is now commercially available. In water softening and demineralization it has shown operating capacities nearly double that of resins previously available. The elimination of the phenolic group from the resin structure greatly enhances the chemical stability and permits operating in a wider range of pH, in the presence of oxidizing agents, and in water up to 100° C.

PROCESSES FOR MODIFYING ROSIN. J. Rinse. J. Polymer Sci. 3, 371-5 (June 1948). Rosin can be modified by two fundamentally different methods, which usually are combined to get the best results. These methods are based on neutralization of the carboxyl group and reaction with the unsaturated part of the rosin molecule. The products are used as a filler to improve gloss and hardness of the paint or varnish film. They are easily soluble in the common solvents and the harder types promote drying. Depending upon the method of treat-

ment, they are more or less liable to oxidation. The molecular weight increases most for the phenolic- and maleic-modified ester gums and especially when esterified with pentaerythritol.

Performance Characteristics of Tight White-Oak Laminated-Stave and Solid-Stave Barrels. R. S. Kurtenacker and D. L. Patrick. Trans. A.S.M.E. 70, 547-51 (July 1948). Barrels manufactured with laminated staves and plywood heads gave better performance in the laboratory tests than barrels manufactured with solid staves and multiple-piece solid-wood heads. The laminated-stave barrels tested sustained greater average maximum loads and with less distortion than the solid-stave barrels in both the compression test on bilge and the diagonal compression test on edge. The solid-stave barrels were more susceptible to loss of liquid contents during filling and during testing than were the laminated-stave barrels.

# Applications

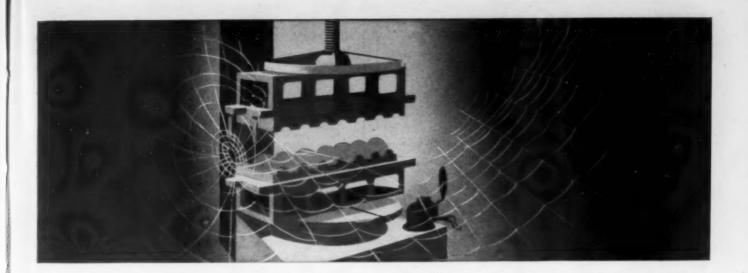
POLYETHYLENE PACKAGING FOR CHEMICALS. Chem. Ind. 63, 39 (July 1948). Bottles, caps, cap liners, jars, etc., are made from polyethylene to package chemicals. Drums and barrels are also being lined with this plastic. The inertness and low permeability to chemicals are outstanding properties of polyethylene.

### **Properties**

BEHAVIOR OF PLASTICIZERS IN VINYL CHLORIDE-ACETATE RESINS. M. C. Reed and L. Connor. Ind. Eng. Chem. 40, 1414-22 (Aug. 1948). A group of 99 materials was evaluated as plasticizers in a commercial vinyl chlorideacetate resin. A range of three concentrations of plasticizer was used and the same methods of evaluation were employed as in previous work. Plasticizing efficiency is shown by elongation at 1000 p.s.i. at 10, 25, and 40° C. Data are also given at these three plasticizer concentrations for volatile loss, oil extraction, water extraction, flex temperature, and compatibility with the resin. For most of these plasticizers chemical composition, viscosity at 20° C., and specific gravity are shown. The rate of volatile loss of plasticizer from sheeting was found to vary inversely with sheet thickness and to double with an increase of 7° C. The amount of loss is linear with time of exposure. An equation for converting rate of plasticizer volatilization on an accelerated basis to other conditions of exposure is presented. Low vapor pressure and good chemical stability are essential to permanence in the plasticized composition.

CHARACTERISTICS AND CONFIGURATIONS OF REINFORCED PLASTIC JOINTS. R. J. Francis. Product Eng. 19, 104-5, 134-5 (May, June 1948). The advantages and disadvantages of various types of joints used in constructions made of reinforced plastics are described. Many types of joints are illustrated.

SURFACE TENSION OF POLYOXYETHYLENE GLYCOL SO-LUTIONS. A. Couper and D. D. Eley. J. Polymer Sci. 3,



crippled by the cresol shortage?

SWITCH TO No. 5040

and get even better dielectric laminates!

Yes—you'll get laminates equal to or better than those produced with the best general purpose straight cresol varnishes, both dielectrically and mechanically. Yes -you can get any reasonable amount of this phenolbase replacement. Yes-you can get it in either natural color or black-just specify No. 5041 if you prefer the latter. In short, you can maintain production without sacrificing quality of product . . . by switching to No. 5040 Plyophen. For recommended procedures in connection with the specific application in which you are interested, write direct to the Sales Department at Detroit.

# REICHHOLD CHEMICALS, INC.



Other Plants: Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Seattle, Washington • Tuscaloosa, Alabama Liverpool, England • Paris, France • Sydney, Australia • Zurich, Switzerland • Milan, Italy • Buenos Aires, Argentina

CHEMICAL COLORS . PHENOLIC PLASTICS

# free trial!

We'll prove Gypsy Plastic Dyeing is beautiful, practical. Send sample of plastic material and color desired. We'll dye it and include sample of Gypsy Plastic Cement to match. No obligation.



### PLASTIC DYES

CONCENTRATES—Designed to enable user to mix his own cold or hot dip solutions as needed. Concentrates contain no volatile solvents so can be stored indefinitely without loss or deterioration. Ten standard clear, brilliant colors or any special color mixed to order. Complete instructions furnished.

READY-TO-USE SOLUTIONS—Choice of ten standard beautiful colors, any special combination. Ready-to-use dyes for Acrylic, Acetate, Nitrate, Vinylite, Ethyl Cellulose, Available in pints, quarts, gaillons.

New Gypsy Plastic Cement! Non-inflammable, non-explosive, solvent weld type. Clear or colored weld, solvent type.

NEWI GYPSY INTERNAL CARVING DYE. Full line of beautiful pastel shades.

Write for Literature and Prices

# GYPSY DYES, Inc.

Division of Wittie Mfg. Co., Inc. 1414 S. WABASH AVE., CHICAGO 5, ILL.



345-9 (June 1948). The surface tension of polyoxyethylene glycol in water leads to a value for the area per molecule which shows that the polymer molecules lie approximately flat in the surface. Molecular weight determinations by end-group analysis and freezingpoint depression are compared with values of the intrinsic viscosity and limiting area per molecule.

Cellulose Ester Plastics. L. W. A. Meyer and W. M. Gearhart. Ind. Eng. Chem. 40, 1478-85 (Aug. 1948). The physical properties of plastics compounded from cellulose acetate butyrate and homologous series of phthalate and sebacate esters show fairly good correlation with solvent ability of the plasticizer for the polymer as determined by viscosity relationships of dilute solution of the cellulose esters in a mixed solvent consisting of plasticizer and acetone. The toughness of the plastics at low temperatures shows some correlation with the viscosity-temperature relationship of the plasticizers. More data on this and other polymer systems are needed to establish more generally the relationships between the physical properties of the plastic and the solvent power of plasticizers over a temperature range.

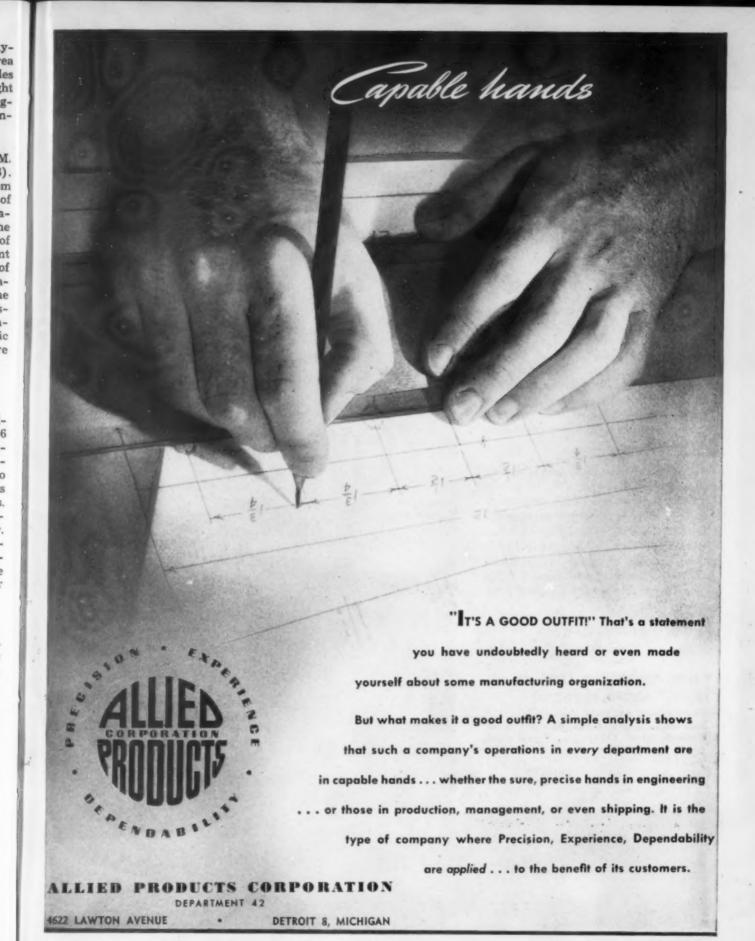
### Chemistry

Initial Rate of Polymerization of Styrene. G. Goldfinger and K. E. Lauterbach. J. Polymer Sci. 3, 145-56 (Apr. 1948). The initial rate of polymerization of highly purified styrene in bulk was measured dilatometrically at 38.4, 56.4 and 70.1° C. For conversions up to 1% a well-reproducible rate was observed for samples handled in complete absence of atmospheric gases. For samples saturated with air an equally reproducible, though higher rate was observed initially. The duration of this higher rate decreases with increasing length of storage between saturation and measurement. After polymerization at higher rates, the sample continues to polymerize at the rate observed for air-free samples.

ALPHA- AND BETA-HYDROXYLS OF GLYCEROL IN PREPARATION OF ALKYD RESINS. H. A. Goldsmith. Ind. Eng. Chem. 40, 1205-11 (July 1948). Certain changes are observed in the behavior of fatty acid modified alkyds when monoglycerides (from fatty acids and glycerol or from triglyceride oils and glycerol) are used in place of fatty acids, or when the order of introduction of the alkyd ingredients is modified. The primary hydroxyls of glycerol react more readily with phthalic carboxyl than with that of fatty acid, whereas the reverse occurs with the secondary hydroxyl. This observation is used to interpret the differences between the two types of alkyds.

### Synthetic Rubber

AN IONIC REDOX ACTIVATION OF BUTADIENE-STYRENE COPOLYMERIZATION. P. H. Johnson and R. L. Bebb. J. Polymer Sci. 3, 389-99 (June 1948). A redox-activated emulsion polymerization system was developed in which benzoyl peroxide, sorbose and ferrous ammonium sulfate constitute the oxidation reduction system. Very rapid rates of reaction were obtained which permitted the use of lower polymerization temperatures. Redox polymers made at 10° C. had higher molecular weights and superior physical properties compared to standard GR-S as well as to polymers prepared in the redox system at higher temperatures.



n-

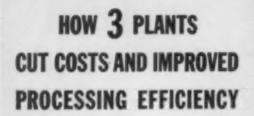
M.

m

nt of

ie

HARDENED AND PRECISION GROUND PARTS . STANDARD CAP SCREWS . SPECIAL COLD FORGED PARTS SHEET METAL DIES FROM THE LARGEST TO THE SMALLEST . JIGS . FIXTURES . STEAM-HEATED PLASTIC MOLDS . SPECIAL PRODUCTION TOOLS . R-B INTERCHANGEABLE PUNCHES AND DIES . DIE MAKERS' SUPPLIES



The success "secret" in all three of these cases is planned processing flow.

Developed from start to finish by Farrel-Birmingham engineers, each of these layouts is composed of production machines matched in capacity to prevent the "choking" or "starving" of succeeding units. Production flows without costly interruptions and with manual aid and supervision reduced to a minimum.

The Farrel-Birmingham Engineering Planning Division is staffed by men with a background of many years of experience in solving processing problems for the rubber and plastics industries. These men will be glad to discuss the possibility of improving your production efficiency and cutting your handling costs through planned processing flow.

Why not call on them today?

# FARREL - BIRMINGHAM COMPANY, INC. ANSONIA, CONNECTICUT

nis: Ansonia, and Derby, Conn., Buffalo, N. Y. Seles Offices: Ansenia, Buffalo, New York, Boston, Pittsburgh, Akron, Chicago, Los Angeles, Tulsa, Houston

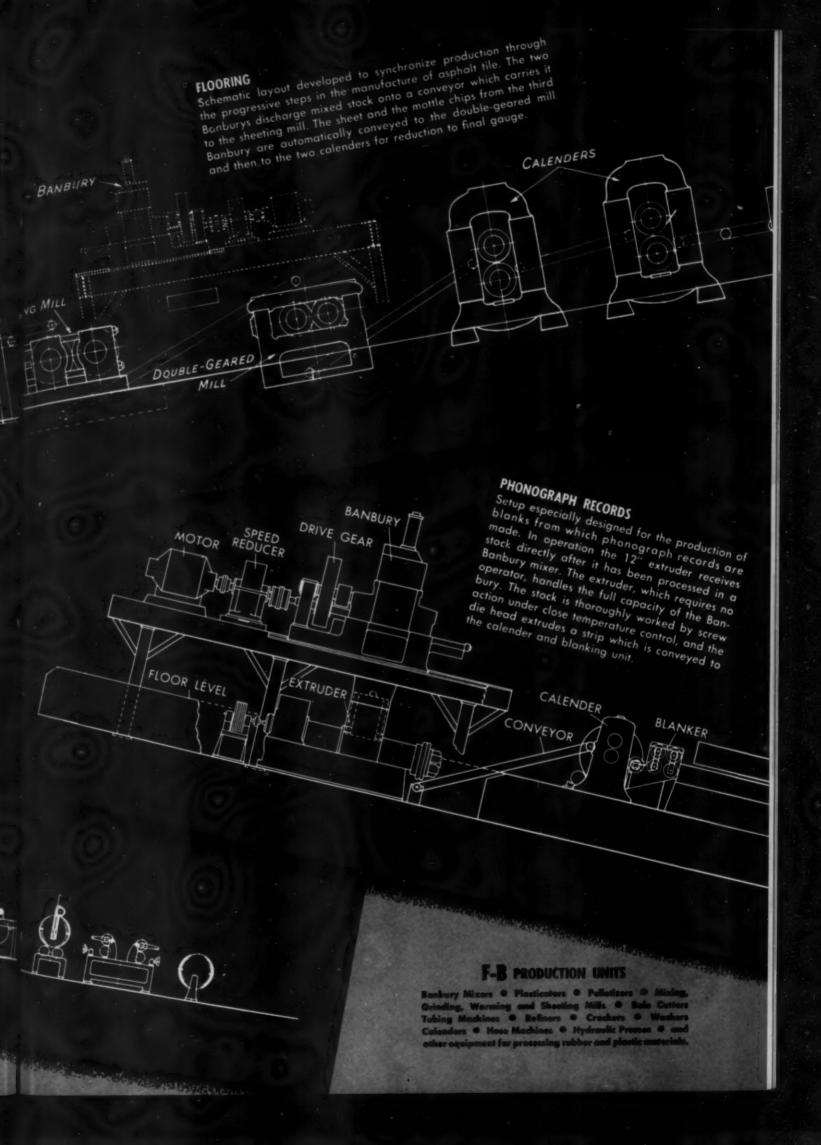
# PLASTIC FILM

BANBURYS

BAN

Originally developed for one producer of plastic film, this setup has since been generally accepted as the standard production unit for plastic film and coatings, Matched production unit consists of a 3A Banbury, 22" x 60" mill and 24" x 66" calender. The size and design of the Banbury and mill assure an even flow of properly conditioned material to the colender. The approximate 1200 pounds per hour capacity of the Banbury gives full time operation, without overload, to the mill. The calender is in ideal balance with the other two machines.





# U.S. PLASTICS PATENTS

Copies of these patents are available from the U. S. Patent Office, Washington, D. C., at 25¢ each.

OPTICAL LENSES. J. Johnson (to Combined Optical Industries, Ltd.). U. S. 2,443,826, June 22. Molding optical lenses from organic plastics.

Insulation. G. J. Bohrer (to General Electric Co.). U. S. 2,443,887, June 22. Fibrous material impregnated with an N-substituted tetrachlorophthalimide, a resinous reaction product of a glycol, tetrachlorophthalic anhydride, a fatty acid, and flame-resistant plasticizer.

ADHESIVE. D. S. Bruce and H. L. Heise (to Gummed Products Co.). U. S. 2,443,889, June 22. Adhesive comprising polyvinyl alcohol and a concentrate of waste sulphite liquor.

EMULSIONS. H. M. Collins (to Shawinigan Chemicals Ltd.). U. S. 2,443,893, June 22. An aqueous emulsion of hydrolyzed polyvinyl acetate, a water-soluble gum, an anionic surface-active agent, and a high polymeric resin.

SILICON POLYMERS. E. K. Ellingboe (to E. I. du Pontes de Nemours & Co., Inc.). U. S. 2,443,898, June 22. A polymeric beta-hydroxyethylsilanol.

RESIN. E. P. Irany (to Shawinigan Chemicals Ltd.). U. S. 2,443,913, June 22. Water-soluble reaction product of sulfonated crotonaldehyde and rosin or rosin oil.

COPOLYMER. J. L. Jones (to Libbey-Owens-Ford Glass Co.). U. S. 2,443,915, June 22. Polymerizate of styrene; an ester of two unsaturated alcohols with an ester of not more than two saturated alpha-hydroxy monocarboxylic acid molecules, and an unsaturated dibasic acid; and a peroxide catalyst.

POLYMERS. C. W. Mortenson (to E. I. du Pont de Nemours & Co., Inc.). U. S. 2,443,923, June 22. A mercaptocarboxylic acid ester of a hydrolyzed ethylenevinyl acetate interpolymer.

GASKET CEMENT. C. M. White (to Genesee Research Corp.). U. S. 2,443,998, June 22. Cement comprising a blend of polyvinyl butyral and polyvinyl acetate dissolved in a monoethyl ether of ethylene glycol.

CONDUCTIVE ADHESIVE. N. H. Collins and R. J. H. Beverton (to Standard Telephones and Cables, Ltd.). U. S. 2,444,034, June 29. A conductive adhesive comprising a jelly-like mass of cellulose ester, benzyl alcohol, and finely divided noble metal.

POLYMERIZATION. R. V. J. McGee (to Standard Oil Development Co.). U. S. 2,444,057, June 29. Polymerization of gaseous olefins.

LAMINATE. H. T. Neher and La V. N. Bauer (to Rohm and Haas Co.). U. S. 2,444,059, June 29. A laminate of acrylic resin sheets bonded with a plasticized vinyl chloride copolymer.

COMPOSITE. F. W. Duggen (to Bakelite Corp.). U. S.

2,444,094, June 29. An acetone solution of maleic anhydride, vinyl chloride, and vinyl acetate is applied to a fiber base, solvent is volatilized, calendering is effected, and a coating of plasticized vinyl resin is applied with heat.

HOLLOW ARTICLES. A. L. Best. U. S. 2,444,150, June 29. Coating contiguous plastic surfaces, heat-sealing, and distending.

THERMOSETTING RESINS. P. Castan (to De Trey Freres S. A.). U. S. 2,444,333, June 29. Dihydric phenol reacted with epichlorhydrine or alpha-dichlorohydrine in the presence of alkali hydroxide is hardened with heat.

DIAPHRAGMS. J. C. Arnold (to Lane-Wells Co.). U. S. 2,444,394, June 29. Thin articles formed by molding thin fabric reinforcing sheet which has been coated with heat-curable resin.

EMULSIONS. H. M. Collins and G. O. Morrison (to Shawinigan Chemicals, Ltd.). U. S. 2,444,396, June 29. A stable emulsion of polyvinyl acetate containing a hydrophilic emulsifier, and an organic liquid conditioning agent.

SHEET FORMING. G. W. Borkland. U. S. 2,444,420, July 6. Drawing plastic sheet and annealing same.

INFRA-RED FILTER. E. R. Blout and W. F. Amon, Jr. (to Polaroid Corp.). U. S. 2,444,492, July 6. Laminated sheet of linear polyamide containing a dye which absorbs infra-red light.

DOPED FABRIC. B. R. Hanson (to Sherwin-Williams Co.). U. S. 2,444,507, July 6. Process for preparing airplane fabric predoped with cellulose derivative dope.

OPTICAL ELEMENTS. J. H. Richardson (to Polaroid Corp.). U. S. 2,444,532-3, July 6. Optical elements are molded in optically plane molds, coated with a tacky skin of polymerizable material, applying backing to said skin, and coating to bind the backing.

ABRASION RESISTANT ACRYLICS. E. H. Kroeker and W. J. Croxall (to Rohm and Haas Co.). U. S. 2,444,655, July 6. Process for the preparation of abrasion-resistant acrylic polymers.

LIGHT POLARIZING FILMS. F. K. Signaigo (to E. I. du Pont de Nemours & Co., Inc.). U. S 2,444,712, July 6. A light polarizer consisting of a sorption complex of a dichroic strain on a molecularly oriented solid polyvinyl orthoborate.

ELECTRICAL COIL. H. P. Heath (to Western Electric Co., Inc.). U. S. 2,444,737, July 6. An electrical coil comprising an inner tube of a polyamide, a winding, insulation, and a polyamide covering.

RESIN. R. W. Auten and J. L. Rainey (to Resinous

# **ELASTRON**

# means quality in consumer items

ELASTRON is the flexible polyvinyl plastic, compounded and extruded exclusively by Industrial Synthetics Corporation. ELASTRON will not crack, ship, peel, or rot, and resists rough usage. It is non-inflammable and is cleaned with a swish of a damp cloth. Colorfast brilliant hues combined with a variety of surface finishes such as high-gloss patent, box calf, pin seal and grosgrain impart the "superior quality" look to products made of ELASTRON.

# saves finishing operations

ELASTRON extrusions are produced with smooth or beaded edges eliminating sewing or other edge-finishing operations. That's why ELASTRON is ideal for watch straps, suspenders, belts, baby harnesses, handbags, furniture webbing and upholstery piping, and straps and handles for luggage; radios and cameras.

# available in many shapes

oble, suitable for use as appliance Eumpers, refrigerator gaskets, sho

\*Reg. U.S. Patent Office

INDUSTRIAL SYNTHETICS CORPORATION 225 NORTH AVENUE, GARWOOD.



Then you'll want to investigate Ferro's inorganic colors—ideally suited for compression and injection molded plastics. Select from full color range, Colors stable (to 2300 degrees Fahrenheit) and highly chemical-resistant. Write for further details and samples.

Color Division

# FERRO ENAMEL CORPORATION

4150 East 56 Street



Cleveland 5, Ohio



Products and Chemicals Co.). U. S. 2,444,802, July 6. A thermosetting resinous product containing sulfonate groups obtained by condensing urea, an aldehyde, and a water-soluble hydroxy alkane sulfonate.

COPOLYMERS. A. M. Clifford (to Wingfoot Corp.). U. S. 2,444,807, July 6. A copolymerizate of vinyl furane and alpha-alkyl acrylonitrile.

POLYMERIZATION. R. G. Fordyce (to Monsanto Chemical Co.). U. S. 2,444,817, July 6. Vinyl acetate and an allyl or methallyl ester of maleic, adipic, or succinic acid are copolymerized by heating a mixture in the presence of benzoyl peroxide.

POLYMER. A. Johnson (to Tek Hughes, Inc.). U. S. 2,444,827, July 6. Preparation of filaments by condensation polymerization of nitromethane, acetone, and adipic acid.

EXTRUSION APPARATUS. K. B. Kilborn (to Wingfoot Corp.). U. S. 2,444,831, July 6. Extrusion means for forming a composite strip of plastic material.

Design Treatment. I. Tornberg (to Dadson Enterprises, Inc.). U. S. 2,444,863, July 6. The appearance of printed matter is improved by surprinting with liquid transparent adhesive, applying fusible resinous powder, and fusing.

CHEWING GUM BASE, W. P. Cohoe (to American Chicle Co.). U. S. 2,444,871, July 6. A chewing gum base incorporating a urea-formaldehyde or ketone aldehyde resin.

ELECTRICAL SEAL. P. Robinson and P. H. Netherwood (to Sprague Electric Co.). U. S. 2,444,880, July 6. A condenser insulated from the terminals by a molded melamine-formaldehyde resin.

ACRYLONITRILE TREATMENT. S. Silverman (to E. I. du Pont de Nemours & Co., Inc.). U. S. 2,445,042, July 13. Physical properties of acrylonitrile polymers are improved by heating in relaxed condition at 80 to 300° C. and tensioning insufficiently to stretch.

ETHYL CELLULOSE. C. E. Rehberg, W. C. Mast, and C. H. Fisher (to U. S.). U. S. 2,445,084-5, July 13. A plastic composed of ethyl cellulose, a polymerized acrylic ester plasticized with a lactic acid ester or an ester of a polyhydric alcohol and a saturated hydroxy carboxylic acid.

POLYMERS OF ACENAPHTHYLENE. H. F. Miller and R. G. Flowers (to General Electric Co.). U. S. 2,445,181, July 13. A composition comprising an interpolymer of acenaphthylene and a vinylidene compound.

POLYMERIZATION CATALYSTS. E. C. Shokal (to Shell Development Co.). U. S. 2,445,189, July 13. Polymerization of unsaturated polyesters by adding a peroxy catalyst and a hydrogen halide, the latter to prevent discoloration.

POLYSULFIDE CONDENSATES. T. A. Te Grotenhuis and G. H. Swart (to General Tire and Rubber Co.). U. S. 2,445,191, July 13. Vulcanizable condensates prepared by reacting ethylene dichloride and butadiene dichloride with aqueous inorganic alkaline polysulfide.

(Please turn to next page)



New developments in synthetics, natural rubber and blends of both have enabled our chemists to assemble a backlog of compounds to meet more strenuous and exacting specifications than rubber ever met before. Fountain pen manufacturers, for instance, were able to pick a compound that gave them the exact capillary action in the feed rod needed to assure an ever-ready flow of ink.

Many manufacturers have solved design and production problems by taking advantage of hard rubber's good machining qualities and stability when in contact with oil, water, heat, cold and changing temperatures. Hard rubber is tough and resilient. Over-all, its physical properties are high. Alkalies, most solvents and acids have no effect on it. The new hard rubber finishes to a really lustrous, polished ebony. And it usually costs less than other materials being considered for the same job.

#### Complete service

6

S.

m

ot

or

of id

We have the research and engineering setup to help you select the right compound for the job and the modern equipment to follow through with deliveries that meet specifications. Our laboratory carries on a three-fold program that includes pure research, industrial application and product quality control. As a result, our engineers are able to suggest new materials as they are developed by our laboratories or suppliers. And when a problem of price, supply or other emergency exists, they are able to apply the best substitute available.

#### Please put us on your inquiry list

The next time you need hard rubber rods or tubes, or have a spot where you think either might be used, we would appreciate being called in. We might have just the right compound for your job. We manufacture rods and tubes in rough, ground or polished form in a wide range of sizes. And there's also a good chance that our experience and facilities for large volume production will enable us to fill your needs at reasonable cost.

#### VULCANIZED RUBBER AND PLASTICS COMPANY

Manufacturers of Rubber and Molders of Plastics 4 E. 29th Street, New York 16, N.Y.



NATCO A-33A Combination Hand and Foot and Air Gil Feed Machine with or without air operated automatic rotating table

• The new NATCO A-33 Light Sensitive Machines offer maximum production on plastics where super sensitive operations and high speed are of paramount importance. These NATCO machines offer flexible spindle arrangements for up to ten spindles. Spindle speeds from 650 to 3550 RPM are provided by quick-change sheave arrangement. Close control and high speed are features of all three models of the NATCO A-33 Machines providing the following feed arrangements: (Model A-33A) Hand and Foot Feed; (Model A-33A) Combination Hand and Foot and Air Oil Feed; (Model A-33B) Air Feed. Write Dept, MP for NATCO Bulletin 247.

#### Call a <u>Natio</u> Field Engineer

for High-Speed
Supersensitive
Drilling and Tapping
in Plastics



NATIONAL AUTOMATIC TOOL CO., INC., Richmond, Ind., U.S.A.
Branch Offices. 1809 Engineering Bldg., Chicaga • 409 New Center Bldg.,
Detroil • 1807 Elmwood Ave., Buffalo • 7902 Commerce Bldg., N. Y. Cily.

## TRUST

Consistent with today's increased need for closest coordination between buyer and vendor, our designers and engineers are always eager for personal conferences. Your inquiries are regarded here as important trusts, your orders regarded as sacred trusts.

#### COLUMBUS MOLDED PLASTICS CORPORATION · Columbus, Indiana

dianapolis, Stanley G. Disque 620 Board of Trade Building, Franklin 3654 • Louisville, Larles Brown, 416 West Jefferson, Wabash 157 • Crecimmet, C. Howard Ienin, 1633 thion Trust Building, Main 6110 • Chicago, Donald W. Larson, 140 North Dearborn, Franklin 1138 • Detreit, David G. Oug, Fisher huilding, Tranity 1-3290 • St. Louis, S. S. Baker, 500 Gray Avenue, Republic 1944 • Cleveland, Mead Cornell, Jr., P. O. Ben 2682 Boulevard 9576 • Milwaukee, Tom Hurd, 739 North Broadway, Phone Marquette 0632

FOR REINFORCING
PLASTICS

\*

J.H. LANE & CO., Inc.
250 W. 57th St. New York, N. Y.

CARBOXYMETHYL CELLULOSE. M. Landers (to Lanco Products Corp.). U. S. 2,445,226, July 13. A water-soluble composition comprising small granules of a salt of carboxymethyl cellulose individually coated with thin films of a glyceride.

PANEL FORMING. D. Gonda (to Holoplast, Ltd.). U. S. 2,445,290, July 13. A method for producing rigid hollow panels from uncured thermosetting resin impregnated fiber strips.

Vanillyl Alcohol Resins. H. F. Lewis and I. A. Pearl (to Sulfite Products Corp.). U. S. 2,445,292, July 13. A resin formed by heat condensation of hot vanillyl alcohol and formaldehyde in the presence of an acid catalyst.

Cellulose Ethers. P. Van Wyck (to Hercules Powder Co.). U. S. 2,445,374, July 20. Granular ethyl cellulose containing as stabilizer an inorganic copper compound.

POLYMERS. D. W. Young and N. M. Elmore (to Standard Oil Development Co.). U. S. 2,445,378-9, July 20. Copolymers of olefins and conjugated alkoxy diolefins.

MOLDING. P. A. Norris (to General Motors Corp.). U. S. 2,445,405, July 20. Mold for injection molding of annular steering wheels containing metal reinforcements therein.

Soldering. L. R. Hill (to Westinghouse Electric Corp.). U. S. 2,445,431, July 20. A soldering flux comprising the partial reaction product of a polybasic organic acid and a polyhydric alcohol.

Lens Cement. W. F. Parsons and J. R. Dann (to Eastman Kodak Co.). U. S. 2,445,535-6, July 20. A thermosetting lens cement comprising a partially polymerized mixture of an alpha methacrylic ester and divinyl benzene.

ADHESIVE SHEET. E. M. Beavers (to Resinous Products and Chemical Co.). U. S. 2,445,553, July 20. A pressure-sensitive flexible adhesive sheet comprising a flexible backing, an insoluble coating having a tacky surface, the remainder being infusible, said resin being a linear polyester containing propylene glycol.

POLARIZING SHEET. F. J. Binda (to Polaroid Corp.). U. S. 2,445,555, July 20. A sheet of oriented polyvinyl alcohol having oriented dichroic polyvinyl alcohol-polyvinylene complex incorporated therein and a layer of polyvinyl alcohol-boric acid complex.

POLYSILOXANES, J. R. Elliott (to General Electric Co.). U. S. 2,445,567, July 20. Liquid organo-polysiloxane is stabilized by incorporation with a metal salt of an organic carboxylic acid.

POLARIZING SHEET. M. Hyman, Jr. and C. D. West (to Polaroid Corp.). U. S. 2,445,579, July 20. A light polarizing oriented linear polymer sheet having oriented dichroic sorption complex of the polymer and iodine and boric acid.

POLARIZING SHEET. E. H. Land (to Polaroid Corp.). U. S. 2,445,581, July 20. An image-bearing layer comprising oriented polyvinyl alcohol having a dichroic sorption complex of iodine is treated with boric acid solution to alter light-transmission.



RAILWAY EXPRESS offers you a complete transportation package. Around its nation-wide facilities is built a convenient, economical shipping service including door-to-door pick-up and delivery in all principal cities and towns at no extra cost. It is designed to meet every one of your business or personal shipping requirements.

Your shipments are carried swiftly over America's railroads and scheduled airlines — providing an all-inclusive service for a single charge. Consistent improvement in equipment and methods is your assurance of a continued, dependable, coordinated shipping service to you, your community and the nation.



## New Cold-Mold Plastic Powder



GLADITE revolutionizes the coldmolding plastic field. Requiring NO PRE-HEATING, NO PRE-FORM-ING, NO AFTER BAKING, NO TUMBLING, your product comes out of the pre-form press finished . . . needs no buffing, grinding, or polishing. You save man hours and cut production costs.

Production up to 30,000 small units per press per hour is possible. GLADITE is adaptable to rotary, single-stroke or hydraulic presses. GLADITE comes in a variety of colors. Can be provided with special dielectric properties for electrical insulating uses; formulated to WITH-STAND TEMPERATURES UP TO 700° F. Finished products are resistant to oil, alcohol and other organic solvents.

GLADITE overcomes almost all previous disadvantages of cold-molding plastic powders. Physical properties can be varied by formula to adapt it to many uses.

Write for free sample canister and try it on your presses. Our engineers are at your service.

Property	GLADITE
Flow	Free Flowing
Bulk Factor	2 to 1
Colors	Black to light pastel
Uniformity of Colors	Good
Dielectric Strength	Good
ARC RESISTANCE	480 seconds (no failure)
Molding Pressure	12 to 15 ton/
Rockwell Hardness	H72
Solubility:	
Alcohol	Slightly to insoluble
ORGANIC SOLVENTS	Insoluble
WATER	0-2% 48 Hr. Test
Oil	Insoluble
Compression Strength	10,000# / in.
Impact Strength	1.93 ave. IZO
Dimensional Stability	Excellent

#### MYLER

COLD-MOLD PLASTIC POWDERS
92 BISHOP ST. • JERSEY CITY 4, N. J.



#### NEW MACHINERY AND EQUIPMENT

Dual-pressure preformer—Preforms of uniform density throughout are said to be possible with Model 294



dual - pressure preformer just introduced by F. J. Stokes Machine Co., 5934 Tabor Rd., Philadelphia, Pressure is applied from both top and bottom at the same time by means of a floating die table. Power application is arranged so that the press cannot jam or rest on dead center. Preforms are produced up to 4 in. in diameter with a die fill of 2% in. Irregular and rectangular pieces up to 6 by 4 in. are

also possible. Auxiliary equipment such as start-stop controls, production counters, and exact pressure controls is available.

Steam table—Plastic material can be quickly softened for forming, bending, or embossing on a new electric steam table developed by Standard Tool Co., 183 Water St., Leominster, Mass. This independent unit can be plugged into any convenient outlet, and can be adjusted to any desired temperature. Two sizes are available: #0 measuring 12½ by 16 in. and #1 measuring 25 by 16 inches.

Nut for removable handles—A Speed Nut has been developed by Tinnerman Products, Inc., 2038 Fulton Road, Cleveland 13, Ohio, to allow quick attachment or removal of stove door handles. The new fastener makes it convenient for the appliance dealer himself to snap the handles in place; reduces breakage in stove assembly, handling, and shipping; and permits the use of smaller crates for shipping. Two Speed Nuts are required for each door handle. The long leg of the nut is inserted into a rectangular hole in the door panel and fastened with a sheet metal screw. Spring steel retainer arms extend from the door panel. The handle, molded with flanges in the back, is snapped in from the top so that the flanges slide under and butt up against the retainer arms of the nuts.

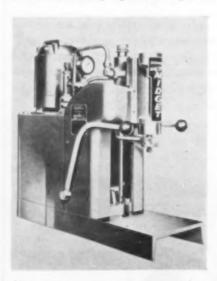
Resin pilot plant—A portable 5-gal. resin pilot plant arranged so as to provide table space for attachment to chemical glassware and auxiliary vessels has been in-

troduced by Blaw-Knox Div., Blawnox, Pa. The kettle has a 2-in. charging opening in the top cover, but the entire cover assembly is readily removable. Discharge is through a 1-in. flush plug type valve in the bottom head. The condenser has a heat transfer area of 0.5 square foot. Internal features include a 5-in. straight blade open turbine agitator and a helical cooling coil which can also be used as a steam heating coil for preheating. A ½-hp. motor drive and step pulleys provide variable speeds of agitation ranging from 443 to 860 f.p.m. Three electrical resistance heaters attached at varying heights to the outside of the kettle and arranged in three circuits supply necessary heat. Allowable pressure ranges from 15 p.s.i. internal pressure to full internal vacuum.

Embosser-Embossing rolls of 2 to 1 ratio, bored or solid steel rolls from 6 to 8 in. diameter, and paper rolls of 12 to 16 in. diameter can be accommodated on the Mono-Block, a new embosser recently put on the market by Hobbs Manufacturing Co., Worcester 5, Mass. Two models of the Mono-Block are available in 32, 42, and 52-in. sizes-straight screw pressure control and hydraulic control. The one-piece steel frame of the embosser has eliminated the conventional drive shaft and allowed an arrangement consisting of a direct V-belt drive to the rewind and embossing head. The construction also permits installation of idler rolls parallel to the female embossing roll. The new embosser will accept any weight of paper from tissue to board stock at speeds up to 300 ft. per minute. It can also handle artificial leather, textiles, foils, etc. The unwind and rewind stands can take rolls of material up to 40 in. in diameter.

Heat source—Oscar Fisher Co., Inc., 104 Worth St., New York 13, N. Y., has recently put on the market tempered glass plates which, through the medium of a metallic compound applied to the rear surface of the glass in a continuous strip, serve as a source of infrared heat. Thermostatic controls maintain heating level. Stock plate sizes are: 15 by 20 in.; 16 by 24 in.; 19 by 24 in.; and 16 by 48 inches.

Multi-purpose, oil-hydraulic press—The Midget, a new low cost, multi-purpose, oil-hydraulic press with a 2000-



lb. capacity, is now being offered by the Engi-Denison neering Co., Columbus, The press comes with its own pumping equipment, measures 13 by 30 by 293/4 in., and weighs 270 pounds. has a ram stroke of 6 in., a throat depth of 45% in., a daylight opening of up to 153/8 in., and a ram speed of 600 i.p.m. up and 400 i.p.m.

down. Because of its size and versatile control, it can be easily moved and used in various ways such as in batteries, for successive operations with all units independently controlled and operated, or with other hydraulic machinery as an accessory unit.

# PLASTIC SCRAP

WE BUY IT ... SELL IT ... RE-WORK IT

Plastics Division:

#### H. MUEHLSTEIN E CO.

122 EAST 42nd STREET, NEW YORK 17, N.Y.

BRANCH OFFICES:

ht il le

n e al

Akron

Chicago

Boston

Los Annels

Memphis

WAREHOUSES:

Jersey City . Akron

Boston · Los Angeles

Memphis

# Shawnee DRYCOLORS COLORS FOR PLASTICS

Red & Yellow Cadmium Toners

Strontium Chromate

Organic Red, Maroon, Blue & Green Toners

Offerings based on extensive experience with leading plastics manufacturers

KENTUCKY COLOR & CHEMICAL CO.

General Office and Works: Louisville, Ky. Branches and Representatives in Principal Cities



Injection Molders
Nylon and all Thermoplastics

**Automotive Products and Novelties** 

SINKO

MANUFACTURING & TOOL CO.

2947 N. Oakley Avenue

Phone LAkeview 4220

Chicago, Jll.



#### BOOKS AND BOOKLETS

Write for these publications to the companies listed. Unless otherwise specified, they will be sent gratis to executives who request them on business stationery

#### "How to Buy and Sell Plastics."

Published by Plastics Materials Manufacturers Association, Inc., Tower Bldg., 14th and K Sts., N.W., Washington 5, D. C. Gratis. 36 pages.

Intended primarily for retailers, this book gives the essential facts on plastics products that should be known by merchandisers who handle them. The text not only presents details on the 11 most common plastics materials likely to be found in retailers' stocks, but gives examples of how they may be advertised to best advantage. Each material is described by pointing out its characteristics; the most representative products for which it is used; how those products may be examined for quality by simple use tests. The reader is carefully informed that plastics is a family of materials, like wood, metal, or fabrics, and that each has its proper place with no one plastic that can perform all functions. Consequently, the importance of knowing each plastic's limitations is emphasized. Written in plain language, the book contains no sales talk, is chary of chemical terms, and has an excellent glossary that will help define any term used in the text. It also points out the necessity for informative labeling. The book was designed and written by Laura E. Morrison, former managing editor of Modern Plastics, under authorization of and with information provided by PMMA.

#### "The Vanderbilt 1948 Rubber Handbook," edited by S. S. Rogers.

Published by R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. Gratis to chemists and technical men in the rubber industry, also to individuals concerned with production in rubber plants; \$7.50 to others. 719 pages.

The ninth edition of this authoritative handbook for the rubber industry is divided into five sections. Section I covers the subjects of dry rubber and latex compounding. Section II, which discusses Vanderbilt compounding materials, lists the company's offices, services, and products. Section III deals with test methods and equipment. Section IV, consisting of general articles, presents the discovery of vulcanization, factory processing control, textile testing, injection molding, and electronic processing in the rubber industry. Section V is a series of tables and charts covering world consumption of natural and synthetic rubbers, consumption of natural, synthetic, and reclaimed rubber in the U.S., mechanical and technical data, etc. Also included in the book is a list of associations and institutions.

#### "Colorimetric Methods of Analysis," by Foster Dee Snell and Cornelia T. Snell.

Published by D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. Price \$4.50, 261 pages.

All the fundamentals of colorimetric analysis are fully explained; the basic theory is presented and is directly applied to the specific methods of analysis in which they are performed. The important types and models of apparatus are also discussed, with particular attention to their relative advantages and disadvantages. Included in the 261-page book are chapters on accessory equipment, such as filters and artificial liquid standards; on related topics, such as calculation of results and accuracy and sources of error; and on subjects allied to

colorimetry, such as nephelometry, turbidimetry, and fluorometry. Also presented is a complete and up-to-date discussion on hydrogen ion concentration.

Bag closing equipment—A complete line of machines for closing multiwall paper bags is described in this eight-page booklet which illustrates machines that will close up to 15 multiwalls per minute. The company's closures are made with a cushion stitch, which, it is claimed, absorbs strains and does not pull out. International Paper Co., Bagpak Div., 220 E. 42nd St., New York 17, N. Y.

Chromatography of sugars and related substances—This 33-page booklet on sugar analyses is No. 10 of a series of scientific reports. The booklet is divided into three general sections: general procedures and definitions of terms, which include chromatographic apparatus, selection of a suitable adsorbent, and operation of the chromatogram; historical review; and application of the chromatographic method to sugars and sugar derivatives (with experimental details), which includes the exploratory chromatogram, paper partition chromatography as a method of end-group assay, and partition chromatography for the resolution of mixtures of methyl ethers of D-Glucose and for end-group assay. Sugar Research Foundation, Inc., 52 Wall St., New York 5, N. Y.

Hard rubber and plastics handbook—The first edition of this 56-page handbook on hard rubber and plastics contains data on the physical and electrical properties of Ace hard rubber and plastics, as well as tables of tolerances, weights, and standard sizes for sheet, rods, and tubes. Several pages in the handbook discuss design techniques for molded parts, inserts, assembly, etc., for rubber and plastics. Six of the pages cover the machining and finishing of hard rubber with similar material on such thermoplastic materials as saran, polyethylene, acrylic, and acetate. The American Hard Rubber Co., 11 Mercer St. New York 13, N. Y.

Studies on nylon dyeing: effect of dyeing procedures (Technical Bulletin No. 798)—Techniques and methods for the investigation of the dyeing of wool, rayon, and other fibers have been applied in this study of nylon. Exhaustive data determined by a time-temperature technique and the penetration and location of dye in the fiber, determined by microscopical methods, have been correlated with methods of application and the tinctorial values of the final dyeing. The study endeavors to arrange the laboratory experiments and presentation of data in a manner which will be most useful to the dyer and which will reveal the progress of the dyeing action. Advertising Dept., Calco Chemical Div., American Cyanamid Co., Bound Brook, N. J.

Hydraulic presses (Bulletins 285, 286)—One of the largest manufacturers of hydraulic equipment has issued two new bulletins describing its line of presses and power tools. The first bulletin, No. 285, consists of 12 pages with 37 illustrations showing and describing different types of hydraulic presses, ranging in capacity

#### A BUYING GUIDE FOR ABRASIVES



Where is there a convenient
Source of Supply?

ind to-

his

vill

y's is

a-rk

nis

es

ee

of

c-

es

as

rs h

n

SSE

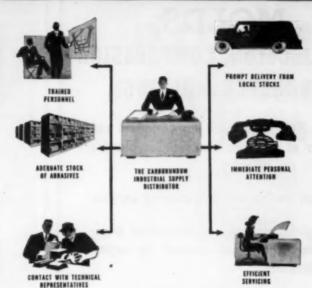
n

#### ANSWER BY CARBORUNDUM

As an efficient and dependable source of supply, the services and facilities of your CARBORUNDUM distributor offer time and money saving advantages.

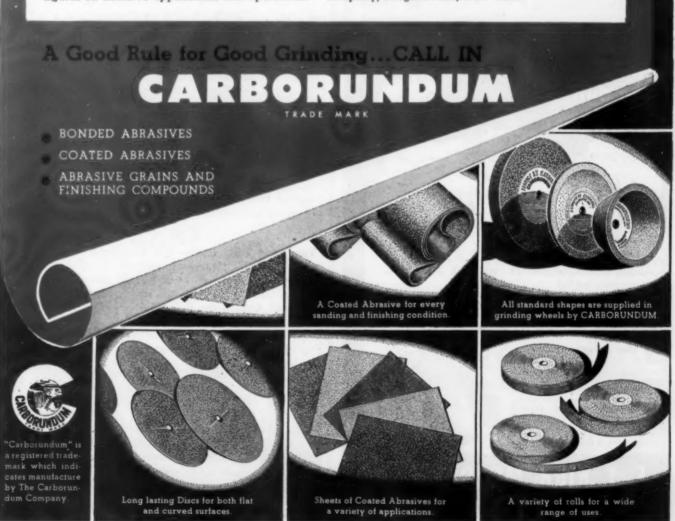
From large and varied stocks of abrasives located conveniently nearby, the products you need are available without delay. Plant inventories can be safely and economically reduced.

Frequent personal service by a trained and experienced local staff provides reliable facts and figures on abrasive applications and operations.



On difficult or unusual jobs, direct assistance from CARBORUNDUM representatives is available.

Simplified buying and other important savings realized from intelligent and efficient handling are creating an increasing preference for abrasives by CARBORUNDUM. The Carborundum Company, Niagara Falls, New York.



## PRECISION-MADE MOLDS

#### for INJECTION, COMPRESSION TRANSFER MOLDING

Plastic Mold Tool & Die Co., designers and builders of all types of molds for plastics offers to the industry:

Expert design and engineering service.

Complete, modern and diversified moldmaking equipment manned by expert moldmakers.

Our engineers will gladly consult with you regarding your design and moldmaking problems and requirements.

#### PLASTIC MOLD TOOL & DIE CO.

E. RUTHERFORD, N. J.

RU 2-7757



It's almost as easy to give the "go ahead" signal on full production as firing a gun. The real trick is to hit the target — your market.

Protect your investment in your new product — try a

Protect your investment in your new product — try a short run market test first. Our Short Run Shop may be able to provide 1,000 injection-molded samples for as low as \$300-\$1,000. Use them for selling tests, research and development.

With the "bugs" ironed out, your product can then be massproduced at lowest cost in our regular plant.

regular plant.

Send drawing or sample for quotation within 10 days. Short runs undertaken only for selling tests, research and development. Your copy of "Short Runs of Injection Molded Plastics" sent upon request.

"The short run is best in the long run"



F. J. KIRK MOLDING CO.

104 Brook St., Clinton, Mass.

from 100 to 6000 tons, for high speed production and accurate forming of sheet metal parts. The other bulletin, No. 286, is a 12-page booklet that presents 21 photographs of standard and custom built steam platen presses for use in the fabricating of belting, brake lining, druggists' sundries, gaskets, packing, grinding wheels, insulating board, linoleum, molded rubber goods, plastic laminates, plywoods, polished plastics sheets, printing plates and mats, rubber tile, and wallboard. The Baldwin Locomotive Works, Eddystone, Pa.

List of vested patents available from Office of Alien Property (PB-88841)—An 85-page compilation of abstracts of 358 United States patents formerly owned by nationals of enemy countries and which, seized by the Department of Justice, are now available for licensing to American firms on a royalty free, non-exclusive basis for the remaining life of the patents. The abstracted patents are classified into broad groups such as "Chemicals and Allied Products," "Electrical Machinery," "Equipment and Supplies," "Metals and Metal Products," etc. Refrigeration, automotive, aeronautics, textiles, paper making, photography, food processing and electronics are among the fields covered. Office of Technical Services, Department of Commerce, Washington 25, D. C., \$4.00.

Chrome-vanadium alloy steel—A four-page bulletin has just been released on D-M-E No. 2 chrome-vanadium alloy steel that is now available for all D-M-E standard mold bases, plates, and parts. The Detroit Mold Engineering Co., 6686 East McNichols Rd., Detroit 12, Mich.

The Coating Corner—This recently launched monthly house organ describes various finishes possible through the use of the company's Tuf-on formulations. It presents case histories of finishing problems with their solutions. Recent issues have discussed fungi, anti-corrosion, protective coatings for meat, and prevention of varnish skinning. The Industrial Research Div., Brooklyn Varnish Mfg. Co., 50 Jay St., Brooklyn 1, N. Y.

How to cut corrosion costs—Illustrated case histories in this four-page folder tell how the company's coatings cut painting maintenance costs by providing machinery, equipment, walls, and floors with effective protection against corrosion from acids, alkalies, oil, and water. Prufcoat Laboratories, Inc., 63 Main St., Cambridge 42, Mass.

Yale Load King scales—Six new three-color technical bulletins, bound together or separately, totaling 68 pages of data, diagrams, selection advice, and practical application information on dial scales have just been announced. One of the bulletins is devoted to the subject of counting scales; two are devoted to bench and portable platform scales. A fourth bulletin describes the dormant platform scale line, while the fifth is on crane scales. The sixth bulletin, which was designed for the dairy industry, discusses the special characteristics of weigh-can installations. R. F. Miller, The Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.

Proportional current-input electronic pyrometer controller (Bulletin No. PB1237)—This bulletin describes the application of a controller in proportioning the current input to electrically heated furnaces, ovens, plastic molding machines, salt pots, and similar equipment to provide practically straight line control. The Bristol Co., Waterbury 91, Conn.



PHONE ULSTER 5.3887 . CABLE CHEMPROD BROOKLYN

GELLULOSE ACETO BUTYRATE . POLYVINYL RESINS, ETC

nd

10-

en ke

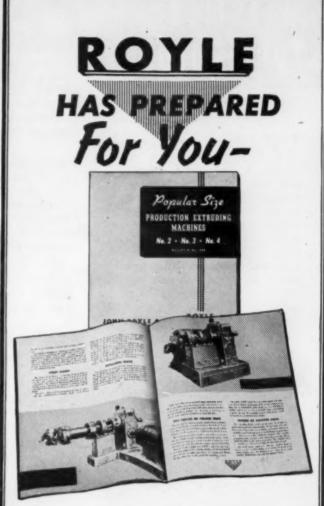
ds,

en

ve

as

al



To meet the many requests for information concerning Royle "Popular Size" Extruding Machines, a fully illustrated, quick reference bulletin has been prepared describing the Royle # 2, # 3, and # 4 extruding machines — the extruders most commonly associated with current extrusion processes.

Please use the handy coupon below to order your copy of this useful bulletin. It will be sent to you promptly and without obligation.

JOHN RO	T., PATERSON 3	ONS ROYLE
PIGNITURE THE C	DNTINUOUS EXTRUS	ON PROCESS IN N. 1.
	e Royle bulletin	titled "Popular Size."
Name		
Address		
City	Zone	State

#### PLASTICS Stock molds\*

#### **NOVEMBER 1948**

- A—Box with hinged cover. Adaptable for packaging jewelry, watches, baby rings, rosaries, etc. Inside dimensions 2½ in. wide, 3¼ in. long, and a choice of % in. or 1 in. depth. Polystyrene. Assorted transparent and opaque colors. This box can be furnished with a variety of insert pads ranging from velvet to plain paper. Utility Plastics, Inc., 1426-66th St., Brooklyn 19, N. Y.
- B—Ladies' hair brush, 8¼ in. long, 2¼ in. high. Brush back may be purchased without bristles, or with a choice of nylon, fiber, or pure bristles. Acrylic. As-

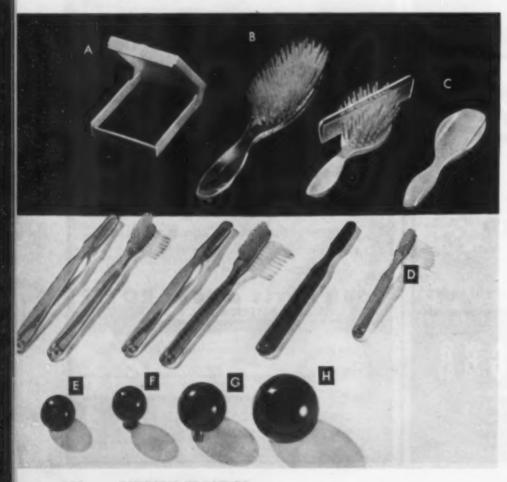
\*Reg. U. S. Patent Office.

- sorted transparent and opaque colors.
- C—Baby's hair brush, 5½ in. long, approximately 1¼ in. high. Brush back (pictured at right) may be purchased without bristles, or with a choice of nylon, fiber, or pure bristles. Butyrate or acetate. Assorted transparent and opaque colors.
- D—Toothbrushes in a variety of styles and sizes. These handles will be furnished without bristles, or with a choice of nylon, fiber, or pure bristles. Butyrate or acetate. Assorted transparent and opaque colors.
- B to D inclusive manufactured by I. Sekine Co., Inc., 232 Madison Ave., New York 16, N. Y.
- E—Control handle used on machines, die sets, etc. Diameter of ball 1 in., weight with inserts ½ ounce. Can be furnished with either female or male inserts from sizes 6-32 up to ¾ inch. Phenolic. Black, red, brown, or mottled colors.

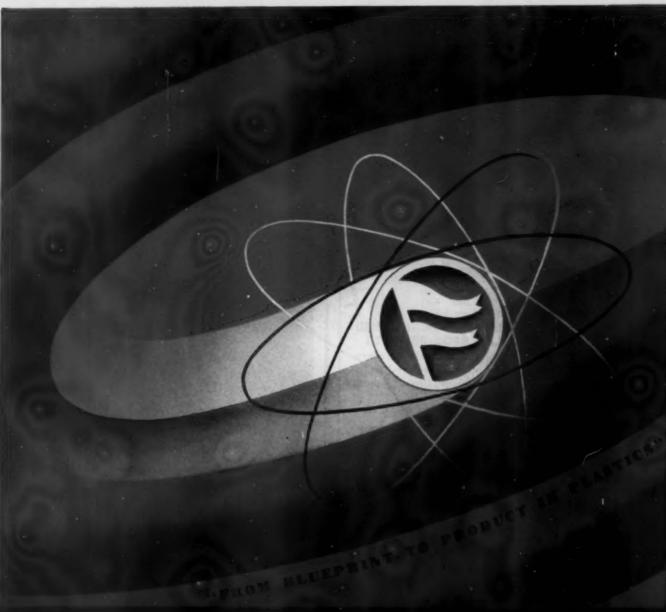
- F—Short shank ball used as handles on various type reels, or on household appliances. One inch diameter ball with 7/16-in. diameter shank % in. long, with standard brass inserts up to ¼-20. Weight with insert ¼ ounce. Phenolic. Black, brown, or red.
- G—Control ball handles widely used as spindle handle on drill presses and on other tool-room machinery. Also may be used as a gear shift lever handle. Diameter of ball 1% inch. Furnished with popular thread sizes up to ½ inch. Can also be furnished with studs. Weight with insert 1½ ounce. Phenolic. Black, red, brown, or mottled colors.
- H—Control ball handle used on heavy machinery and appliances. Diameter of ball 1% in., weight 2 ounces. Available with inserts and molded threads or studs; can be molded with short shank and stud. Phenolic. Black, red, brown, or mottled colors.
- E to H inclusive manufactured by Dimco-Gray Co., 207 E. Sixth St., Dayton 2, Ohio.

#### CORRECTION TO STOCK MOLD SECTION 1948 MODERN PLASTICS ENCYCLOPEDIA

In the Handles Section, Grigoleit Co.'s stove handles J,L,M,N, and O on page 1414 and EE, GG, MM, and TT on page 1415 were erroneously listed as being made of thermoplastic. We take this means of calling to the attention of readers of the MODERN PLASTICS ENCYCLOPEDIA the fact that these handles are made of thermosetting materials.



Molders are invited to submit samples of stock products to be described on this page as space permits. Address samples and detailed information to Stock Molds Editor, MODERN PLASTICS, 122 E. 42nd St., New York 17, N. Y.



#### FELSENTHAL PLASTICS

G. FELSENTHAL & SONS, INC. 4120 W. Grand Ave. • Chicago 51, III.

New York Office

Detroit Office 225 W. 34th St., New York I. N. Y. 731 Fisher Building, Detroit, Mich.



## COMPLETE PRODUCTION SERVICES

- Injection Molding
- Complete Fabricating and Assembly Facilities
- Pressure forming and Deep Drawing of Acrylic

  Chapt • Finishing, Spraying, Painting and Bright
- all Thermoplastic Materials Silvering

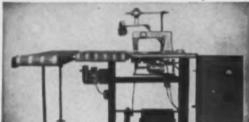
#### MAYFLOWER H.F.

DIELECTRIC HEATING EQUIPMENT

Generators of 500-1000-2500-5000 watts and 15 kilowatts at frequencies best suited to furnishing a basic source of radio frequency heat for average applications.

#### ELECTRONIC SEWING MACHINE

Manufactured under RCA patents



Continuous bonding of Thermoplastic Sheeting from .004" to .040" Thick at Speeds up to 35 feet per minute

#### BAR SEALERS INDIVIDUALLY ENGINEERED FOR YOUR PARTICULAR REQUIREMENTS

Our engineers make a complete analysis of every application where electronic heat is required in a plant and fit the equipment to "overall" requirements and not a single job.

SUBMIT YOUR PROBLEMS FOR SPECIFIC RECOMMENDATIONS

#### Mayflower Electronic Devices, Inc.

A DIVISION OF MAYFLOWER MACHINE AND TOOL CO.
6014 Hudson Boulevard West New York, N. J.
Union 3-7100

#### This is our new home...

with new and additional equipment to serve you even better for your Beryllium copper cavity and core requirements.

WE produce cavities and cores only! WE are not in competition with you...



11471 KERCHEVAL DETROIT 14, MICHIGAN PHONE VALLEY 1-5210



Chair is compression molded of sisal, impregnated with phenolic resins. The legs are bolted to the one-piece unit

#### Contour-Formed Chairs

TWO new chairs which conform to the contours of the human body use plastics for functional purposes. One of these chairs is mass produced for the low-cost market; the other is in the luxury class.

The chair pictured above consists of a one-piece molded seat and back, four bolts, and four metal legs. Made from Co-Ro-Lite, the Columbia Rope Co.'s sisal impregnated with phenolic resins, the chair seat and back are compression molded on a 500-ton press by the General American Transportation Corp., Chicago, Ill. It is reported that the company is capable of manufacturing 200 chairs daily, and can step up production if necessary.

Weighing only 5 lb. without the legs this chair has a contour-formed back rest that comfortably supports the sitter's back. The molded unit is weather and wear resistant. Although it was primarily designed for institutional use, the chair is reported to be ideal for use in offices, schools, restaurants, public waiting rooms, and for functional purposes in the home.

Three colors — natural brown, red, and blue — are now available. However, the chair can be made



A low pressure molded laminate of phenolic impregnated rope fillers is used as the shell of this one-piece chair

in any color desired since the raw material that goes into the molding press is colored by the supplier during the manufacturing process.

The basic design for the contour-molded chair was arrived at by making a series of wax mold impressions from which a composite was produced which is reported to be one that will satisfy the greatest number of people.

#### Molded one-piece shell

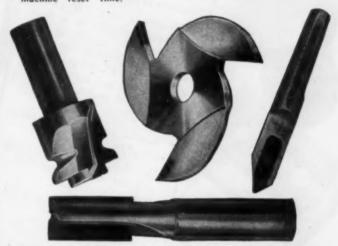
The luxury chair shown above has a low pressure laminate shell made of Corofelt, the Columbia Rope Co.'s fiber filler. This material, impregnated with a phenolic resin, is formed to produce the one-piece shell for the back and seat. This shell, made by the Winner Mfg. Co., Inc., Trenton, N. J., is set in a metal cradle which serves as an undersupport with legs. The shell is padded with foam rubber which is covered with any desired upholstery material. Two removable cushions, shown in the photograph, complete the chair.

Designed and presented by Knoll Associates, New York, N. Y., the shape of this chair is such that its occupant is comfortable in any position — sitting up straight, sitting back in one corner, or sitting sideways with legs dangling over the arm of the chair.

#### SLASH TOOL COSTS SPEED PRODUCTION

#### WITH CARBIDE-TIPPED TOOLS

VELEPEC CARBIDE-TIPPED engraving cutters, end mills, counterbores, countersinks, routing cutters, etc., stay sharp 10 to 30 times longer than regular steel tools. They stay sharper . . . cut cleaner and quicker . . . effect tremendous savings in machine "reset" time.



Send for illustrated catalog or quotations on your requirements.

FRED M. VELEPEC CO.

71-11 64th STREET

GLENDALE, L. I., N. Y.

#### THE PLASTIC



#### MONOFILAMENT SPOOLER

Eliminates breakage

Speeds production

A Plastex Continuous Spooler provides the fastest, most foolproof means of handling monofilaments as they come from your extruder. Its unique design avoids intermediate winding and re-winding on special reels. Since tension is easily regulated by a special clutch mechanism and take-up speeds are automatically variable, winding is level and breakage and distortion of the monofilaments are largely eliminated.

Once installed the Plastex Continuous Spooler can easily be adjusted for winding any monofilament.

For full details about this machine and the Plastex "Orion" Unit for correct orientation of any monofilaments and the Plastex "Coil-on" Unit for flat strip extrusions, write today.

#### PLASTEX MACHINE

CORPORATION

PATERSON 27, NEW JERSEY

## Unother

Copper, for intricate shapes in plastics.



- Produces thin sections—raised letters - irregular shapes that cannot be hobbed in steel. Pressure castings of Beryllium
  - Copper heat treat to at least Rockwell C 45 all the way through, with compressive strength of 200,000 pounds per square inch and tensile strength of 170,000 pounds per square
    - Thermal conductivity is twice
    - Beryllium Copper is corrosion resistant and has excellent wearing qualities.

Full information supplied promptly on request, with out obligation - Write, wire or phone.

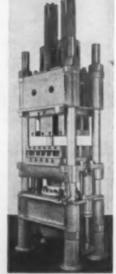
3602 PRATT BOULEVARD CHICAGO 45, ILLINOIS

### HEADS ARE BETTER

As this double ram transfer molding press has two sprues, the necessity of center gating single cavity molds is eliminated. This feature increases the possibilities for mold design where point of gating is important. It also means better and faster fills on pieces that have heavy sections covering large areas. If desired, only one ram may be used.

Several of these presses are in use at Hemco Plastics Division, Bryant Electric Co., Bridgeport, Conn.

We invite your inquiries.





#### S.P.I. Remobilization **Program Meeting**

T special sessions held in conjunction with the Third National Plastics Exposition in New York City, government representatives told plastics operators what the Armed Services want from plastics. The purpose of the meetings was succinctly stated by Dr. Gordon M. Kline, of the National Bureau of Standards and Technical Editor of Modern PLASTICS, who presided at the first session: "We must concentrate on doing our research and development before and not after our need is greatest.'

Digests of the papers read at the meeting are given in the following paragraphs.

#### Certain Electrical Aspects of Plastics in the Bureau of Ships

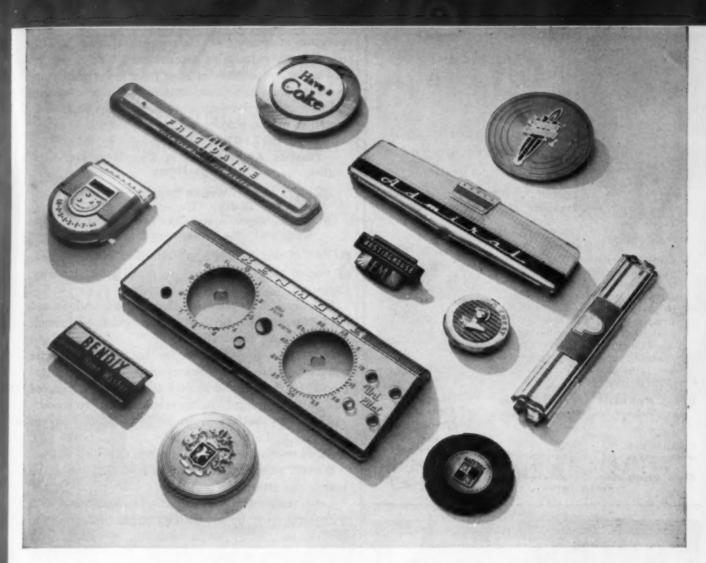
by John B. Alfers Navy Dept., Bureau of Ships, Washington, D. C.

OME of the characteristics most desired in insulating materials for shipboard use in the Navv

- 1. Heat stability at high temperatures of the 200°
- 2. High resistance to electrical arcs and tracking over spacings as short as 1/64 inch.
  - 3. High mechanical strength and shock resistance.
- 4. Intrinsic water repellent surface and low water absorption characteristics.
- 5. Very high ignition temperatures and rapid selfextinguishing features.
- 6. Low dielectric loss characteristics for electronic
  - 7. Ease of production, fabrication, and use.

There are certain promising approaches towards achievement of the above desires. Considerable hope is being placed on the silicones, fluorines, and on the melamines as an intermediate resin. To gain the required rigidity and structural strength, fibrous glass is being employed as the principal reinforcing agent. Fibrous glass, of course, contributes very beneficially to most of the objectives for desirable plastics but binding resins, to enable full advantage to be taken of desirable glass characteristics, are hard to find.

Work on molded thermosetting materials has extended over several years from the old standby, ragfilled phenolic, to asbestos-filled phenolic, to glass fiber and melamine. In addition, considerable effort has been placed on silicone resin glass fiber filled molded material which holds promise of continuous



HOW TO MAKE A NAME FOR YOUR PRODUCT WITH

the ork stics classetly Bu-

ven

su-

nno

ing

ce.

ter

elf-

nic

ds

pe

he

e-

nt.

ly

ut

en l. xg-

ss rt

ed

us

In trade-marks and nameplates—and many another molded plastic part—PLEXIGLAS V offers attractive advantages. Sparkling clarity or sleek opaqueness, gem-like color or crystal transparency, and the infinite variety of forms and designs possible with this injection molding powder, beckon the eye and create *lasting* product-impressions.

#### PLEXIGLAS V

MOLDING POWDER

From a processing standpoint, too, Plexiglas V is profitably practical. The unusual combination of high heat resistance with excellent moldability and exceptional clarity is what makes Plexiglas V a stand-out among injection molding

powders. High heat distortion temperature and low shrinkage provide extraordinary dimensional stability. Flow temperature is low for heatresistant acrylic powders.

Steering wheel medallions, handles, knobs, electric controls, household accessories, and other Plexiclas V molded articles have a brilliance that gives them increased decorative appeal.

In a host of products, this sparkling acrylic plastic makes every piece a masterpiece. Let us show you what it can do for your products. Write for detailed information.

PLEXIGLAS is a trade-mark, Reg. U. S. Pat. Off. PLEXIGLAS acrylic resin sheets, rods, and molding powders are manufactured only by Rohm & Haas.

#### ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Maneinchivers of Chemicals including Plastics - Synthetic Insacticides - Fungicides - Enzymes - Belargents - Cermicides - Chemicals for the Leather, Textile, Ceramic, Rubber, Pager, Patrolium, and Alber (Approximent)





A Small Magnet for a BIG JOB!

New Dings Alnico Perma·Plate Magnet

For Removal of Tramp Iron

Lightest . . . Most Powerful . . . Least **Expensive Alnico Magnet Available!** 

Highest grade Alnico used-for maximum power!. Magnetic permanence guaranteed for life of installation! Non-electric . . . no operating or maintenance expense ... simple to install ... easy to clean, Removes tramp iron from all dry products. Simple, trouble-free design. Standard or special models to fit any system. Complete, ready for installation. Quick delivery. Patent Pending. Write for new bulletin.



In Chutes, Ducts. Pines



Over Belt

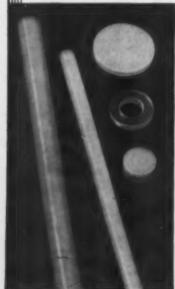
Conveyors

DINGS MAGNETIC SEPARATOR CO. 4737 McGeogh Ave., Milwaukee 14, Wis.

Complete Line of Permanent Electro Magnets



#### TO YOUR REQUIREMENTS



VALVE SEAT DISCS in FM-10001 (Rigid) Nylon

VALVE WASHERS in FM-8001 (Semi-Rigid) Nylon

#### CONTRACT NYLON MOLDING

We have the set-up and the experience to give you the best in nylon parts molding in small or large quantities.

SEND FOR QUOTATIONS ON SPECIFIC REQUIREMENTS

#### **NYLON RODS**

FOR IMMEDIATE DELIVERY

in ¼", ¾" and ¾" diameters and 8¾" lengths in FM-10001. Nylon. Quantity prices an



operation at nearly 200° C., arc resistance up to 300 sec., and other desirable properties.

In laminates, a grade of glass fiber filled melamine seems destined to be used extensively in the future. and a successful development program has been conducted to obtain silicone resin glass fiber laminates.

#### Plastics Applications in Quartermaster Corps Items

by Dr. Warren Stubblebine Research Director, Chemicals & Plastics Section, Research and Development Branch, Office of the Quartermaster General

OME of the specific applications of plastics used. under test, or desired by the Quartermaster Corps are:

A fabric filled phenolic showerhead and faucet for Lister bags that will withstand monkey wrench abuse and can be sterilized.

Low pressure laminates for body armor, arctic boats and sleds, replacement of wooden structural members of an arctic shelter that will be fireproof and have structural characteristics equal to wood.

Adhesives that are moisture resistant, for use in furniture and other items.

Vinyl and butyral coated fabrics that will not become stiff or sticky, are mildew resistant, and have better tear strength.

Low temperature resistant materials that will withstand -60° F. but with an upper limit usage in the 150 to  $170^{\circ}$  F. range.

Unsupported films for optical purposes that are more scratch-resistant than those currently avail-

Melamine tableware is now under test, with several hundred thousand pieces having undergone severe use at the Pentagon Bldg. in Washington. Scratching from a sharp knife is still a problem.

Needed are protective coatings for wood and metal that will withstand dragging over snow and hard ground; a better coating for magnesium in particular is wanted.

Melamine and phenolic buttons present no problems at this stage.

#### The Application of Synthetic Resins and Plastics to Signal Corps Equipment

by Emile McK Beekman Signal Corps Engineering Laboratories, Fort Monmouth, N. Y.

OUR words might be used to define the efforts of the Signal Corps Engineering Laboratories to improve the performance of synthetic resins and plastics. They are tropicalization; winterization; miniaturization; ruggedness.

For tropicalization, plastics resistant to moisture and fungi are necessary. The desire is to use only those plastic materials inherently moisture resistant

#### special design

#### PRODUCTION LINE H. F. HEAT SEALING EQUIPMENT

It's your out of the ordinary, heat sealing problems that Lee looks for. Our development engineers tackle any unusual assignment—even those which have been called "impossible".

Lee service consists of designing, manufacturing and installing special H. F. generators and automatic and semi-automatic heat sealing production lines. Many leading manufacturers are receiving day after day production from Lee-built heat sealing equipment which, because of its special design, is doing jobs no other equipment can.

We suggest you contact Lee today to fill your requirements for custom-built heat sealing equipment for production line operation.

Products, inc.

707 NEW YORK AVENUE UNION CITY, NEW JERSEY





When PLASTIC PARTS Must be Precision-Fabricated . . .

Depend on SILLCOCKS-MILLER

As pioneers in fabricating plastics to close tolerances since 1910, Sillcocks-Miller engineers offer complete facilities to improve products and develop new ideas.

This organization of specialists is recognized throughout the industry for skill in producing special parts or products from plastic sheet material.

When specifications call for precision and uniform production, it will pay you to look to Sillcocks-Miller for quality and service at a price that's right.

Complete facilities for cutting, printing, stamping, cementing, milling, turning, blanking, drilling, drawing, forming, laminating and assembling.

Write for illustrated booklet

The SILLCOCKS-MILLER CO.

#### NEW Design Heavy Duty MILLS



#### ... available with roller bearings

A COMPLETE new line of extra heavy duty individual motor driven 42", 50", 60", 72" and 84" mills for the rubber and plastics industry.

New features include reduced floor space; increased horsepower ratings where necessary; built-in herringbone gear speed reducers, mounted on anti-friction bearings; and our new design, internal expanding, shoe-type, hydraulically loaded safety brake —unquestionably the finest safety device available for mills at the present time. Send for specifications.

- · West Casst Rep.: H. M. Royal, Inc., Las Angeles, Cal.
- · Export Agent: Steinhardter & Nordlinger, 105 Hudson St., N. Y.

#### THROPP

WM. R. THROPP & SONS CO. Trenton, N. J.



#### Advanced AUTOMATIC Temperature CONTROL

TRANSFER — COMPRESSION MOLDERS . . .

The TACO-WEST

#### VERITRON

Electronic Pyrometer Controller
Ultra Design . . . meaning
Dependability, Precision, Economy.

ADVANTAGES:

ADVANTAGES:
Unmatched accuracy and durability — New electronic system eliminates Oscillators, Tuning Devices, Mechanical Motored Mechanisms and Field Adjustments — Control Accuracy unaffected by line voltage variations — Stabilised, Chatter-Free contacting.

SPECIFICATIONS:

Input energy: 8 volt amperes, 115v or 230v, 50-60 cycles — 2 and 3 wire relay systems handling maximum 3 KW non-inductive loads — All standard scale ranges available — Special ranges, voltages and frequencies to order.

Write for complete, illustrated information.

Elmer C. Maywald

Also: Lester Injection Molding Machines; Stainless Steel Cast Mold

rather than to create absorbent materials with moisture-resistant coatings.

For winterization and miniaturization, the search is for materials capable of withstanding operating temperatures up to  $200^{\circ}$  C., with periods of idleness during which the temperature may drop to  $-55^{\circ}$  C.

Ruggedization is the term applied to properties of a plastic that will increase shock and vibration resistance so that equipment can more readily withstand the rigors of transportation, gun blast, etc., and increase shelf-life.

In the development of improved laminated sheets and plates, one of the Princeton research groups has been successful in developing a glass fabric melamine resin laminated material which meets all requirements of the Joint Army Navy Specification P-13.

In the field of low pressure laminates, it is hoped that members of the industry will take steps to develop resins and fillers which will have the required resistance to moisture, and, at the same time, retain the ease of fabrication which makes their use so desirable for certain applications.

Preliminary tests indicate that nylon fabric phenolic laminates possess satisfactory or even better electrical stability, due perhaps to low moisture absorption, than most other types of laminates.

In thermosetting molded materials, the Signal Corps Laboratories are desirous of obtaining a material that combines the dielectric properties of phenolics with the arc resistance of melamines. In rigid thermoplastics, they want a material that combines the dielectric properties of polyethylene, the heat resistance of polydichlorostyrene, and the toughness of nylon.

#### Standards of Performance Required of Plastics Materials by the Armed Services

by I. L. Rosenheim
Chief of the Materials Section of the
Army-Navy Electronic and Electrical Standards Agency, Fort Monmouth, N. J.

THE failure of a plastic is the failure, not of the material, but of whoever used it incorrectly. There is no royal road to the choice of the proper plastic for an application. Complete evaluation of the requirements of the application and complete evaluation of the performance of the material is the only way it may be done.

The group advocating the performance type of specification, as JAN-P-15, have had their day. This type of specification is advocated on the grounds that the user is interested in the performance of the plastic and not in its composition. But it has its drawbacks. Unfortunately, none of the specifications is complete—performance tests are not available for all the characteristics which should be evaluated. Corrosiveness, dimensional stability, and safe operating temperatures are among those character-

## A Cast Phenolic Resing Exceptional Properties

## MARBLETTE

Outstanding among plastics, Marblette has a jewel like depth and a complete color range which duplicates the appearance of precious, stones, tortoise shell and ivory.

Its almost infinite variety of colors is available in transparent, translucent, opaque, or in mottled effects. Marblette also comes in a water clear form known as "Crystle."

Marblette's machining characteristics, resistance to oils and acids, non-inflammability and exciting beauty make it ideal for countless manufacturing needs.

MARBLETTE will help plan your world of tomorrow. The Marblette staff of engineers offers its services to help with your manufacturing problems. Write to us outlining your needs.

#### SPECIAL CASTINGS

Marblette is supplied in sheets, rods, tubes, and special castings such as cutlery handles, kitchen utensil handles, pipe stems, cigare ette holders, clock cases, automotive trimmings, jewelry items, buckles, etc. Special shapes made to customer's specifications can be supplied provided draft is all one way.

#### HE MARBLETTE CORPORATION

Manufacturers of Phenolic Resins since 1929

37-21 THIRTIETH STREET LONG ISLAND CITY 1, N. Y.



Specialists in Injection Mold Making
also Transfer and Compression Molds

#### STANDARD TOOL CO. 83 WATER STREET, LEOMINSTER, MASS.



OMNI PRODUCTS CORP., Export Distributors, New York, N. Y.



Facilities for:

ROLL LEAF PRINTING
PAINTING DEPRESSED LETTERS
THIRD DIMENSIONAL PAINTING
SANDING, POLISHING, ASSEMBLING

2730 ELSTON AVE., CHICAGO 47, ILL.
Plastic Finishing Metal Stamping Assembling

istics for which there exists no standard method of evaluating performance.

Because of these and similar factors, the formulation-performance type specification has been developed. In this type, formulation is specified in more or less detail, and service is evaluated by performance testing.

There are three groups issuing standards of performance for plastics: the industry, the Federal Spefications Board, and the Armed Forces. This does not appear to be a healthy situation but is not as bad as it seems. The various groups are working together. For the greater part, differences in test methods have been eliminated. The results of tests made under one group's specifications may normally be used with little, if any, modification for evaluation of that material under another group's specification. The differences between the various groups' specifications lie in differences in severity of environments in which it is desired to evaluate performance.

#### Plastics for Ordnance Applications

by Dr. Lucius Gilman Ordnance Dept., Picatinny Arsenal, Dover, N. J.

SES to which the Ordnance Dept. is putting plastics are strictly utilitarian, and they are selected entirely on a performance basis in order to take advantage of some particular group of properties which are unobtainable from alternative materials of construction.

For example, it is generally considered disadvantageous that thermoplastics commonly change so greatly in stiffness with falling temperature, but we have found that it will probably be possible to utilize this characteristic to give us a blow-out plug holding increasingly tight as temperature drops.

As a second illustration, the relatively low bursting strength of plastic film is commonly thought to be somewhat disadvantageous, but it has been possible to use plastic film in place of lead foil for the very reason that its bursting strength would not be greater than that of the lead foil.

Similarly, plastics are known to be less resistant than metals during long-time exposure to heat, but the Ordnance Dept. is now recognizing that the low thermal conductivity of plastics makes plastics superior to metals in some applications in the presence of intermittent, short time blasts of flame.

The use of plastics to obtain barriers which are tough but are moisture permeable takes advantage of the fact that plastics are not entirely moisture impermeable as is wished so often, and the use of thermoplastics in place of ductile materials takes advantage of a property—cold flow—which is normally considered an unmitigated evil.

Types of information about plastics needed by the Ordnance Dept. include:

- . ELECTRICAL
- AUTOMOTIVE
- . SURGICAL

S

d

e

n

SCIENTIFIC

#### INDUSTRIES

Let us show you the way to new products molded from nylon. Sample or blueprint requested for estimate.

#### HAUSER PRODUCTS, INC.

Manufacturers of Plastic Products
4034 NORTH KOLMAR AVENUE
CHICAGO 41. ILLINOIS
Phone PEnsacola 6-7670

#### Use HENOPRE

RESIN IMPREGNATED PAPER AND FABRICS

For

## ALL TYPES OF LAMINATES

INDUSTRIAL • DECORATIVE SPECIALTY • MOLDED

#### FABRICON PRODUCTS, INC.

PRODUCTS, INC. PLASTICS DIVISION

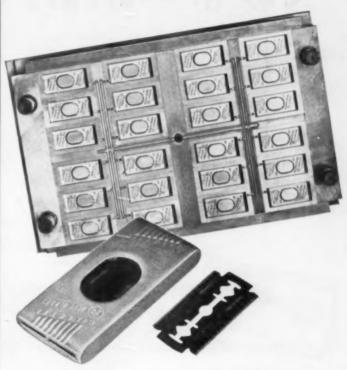
1721 PLEASANT AVENUE • RIVER ROUGE 18, MICH.
VInewood 1-8200

#### REPRESENTATIVES:

Divisions in Principal Cities of the West

CANADA—Plastic Supply Co.
Offices in Toronto and Montreal
WEST COAST—Zellerbach Paper Co.

## STAINLESS MOLD STEEL



Molds for new razor blade dispenser engineered, built, and operated by Foster-Grant Co. for Gillette Safety Razor Co. Cavities were hobbed into Carpenter Stainless No. 2 Mold Steel annealed to maximum Brinell Hardness of 160.

New applications and new techniques can often give you ideas that lead to better molding results. Gillette's new plastic razor blade dispenser is a good example. Produced by the millions, it called for a mold steel that could be hobbed... and one that would provide extra wear resistance, corrosion resistance, and minimum movement in heat treatment. Carpenter Stainless No. 2 Mold Steel not only met this unusual combination of requirements, but also provided high strength, cleanness, and ease of ejection—without the expense of chrome plating!

Find how the extra advantages of Carpenter Stainless No. 2 can help you improve molding and reduce unit costs, too. Your Carpenter representative has all the working information you need. Get in touch with him, today. The Carpenter Steel Company, 112 W. Bern Street, Reading, Pa.





For you who require the finest cores and cavities to meet demands of a discriminating trade, TRU-CAST is the answer. Die-makers everywhere prefer the remarkable uniformity, the reliable performance, and the complete satisfaction that make TRU-CAST Beryllium Copper today's outstanding value.

MORE ECONOMICAL? Certainly! MORE DEPENDABLE? Definitely!! Of Course!!! LONGER LASTING?

> Write, wire or phone for our brochure giving complete details.



MANCO PRODUCTS CO

2401-2409 Schaefer Road

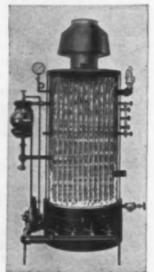
#### ENGINEERED

To Meet Your Needs ...

#### THE KANE BOILER PACKAGE

. . . it's a compact, self-contained steam source that includes: the correctly sized KANE Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency.

Engineered Steam at its best with four decades of experience at your disposal - so, send your steam problem to us for study and recommendation.



KANE Boiler is built to I.E. specifications, in sizes

ENGINEERED STEAM AT ITS BEST

MEARS KANE (OFELD)

1903-1915 EAST HAGERT STREET, PHILADELPHIA 25, PA

FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE

Standard engineering data-tensile strength, shear strengths, apparent moduli, deformation to failure—all at controlled and stated temperatures and rates of loading.

Advanced mechanical data such as the coefficients of thermal expansion at temperatures from -80° F. up to at least + 160° F. More mechanical data desired would be information concerning damping characteristics at stated temperatures, frequencies, and amplitudes.

Impact data on high rates of loading which would be of a sort that could be related to specific parts and designs would be particularly helpful although presumably difficult to obtain.

If the industry has such data available or contemplates obtaining such information, the most economical procedure would seem to involve a preliminary discussion with the Ordnance Dept. in order to be more specific concerning the particular material in question and the data which would be most helpful.

#### Plastics and the Chemical Corps

by Fred B. Shaw, Jr. The Chemical Corps, Technical Command, Army Chemical Center, Edgewood, Md.

URING the war, the Chemical Corps used plastics in 25,000,000 cylindrical lenses for gas masks; in developmental plastic bomb bodies; in individual protective covers; in phenolic fuses for chemical mortar shells; in spray tanks for the dispersion of chemicals from aircraft; in vinyl, urea, and cast phenolic containers for corrosive chemicals; in ethyl cellulose eye shields; in cellulose nitrate powder containers. The MI Fire Starter, consisting largely of jellied gasoline, contained in a cellulose nitrate body, was produced at that time as well as an ignition cylinder body for use in flame throwers, and a gas mask of polyvinyl chlor-acetate for hospital patients was developed. Other plastics were widely used for fabrics and containers when chemical resistance was needed.

Since the war a new phenolic molded riot grenade about the size of a baseball has been put into largescale production, and a strippable coating of cellulose acetate butyrate has been developed for use in prevention of contamination in the filling of military shell, rockets, and bombs with toxic agents. Particular effort is being directed toward the replacement of heavy, non-functioning, metallic parts at present used in munitions, weapons, and protective devices with lightweight, high tensile strength, plastic laminates. Another field has to do with the development of a dimensionally stable, thermosetting, highly inflammable plastic for such purposes as replacement of non-inflammable structural units in incendiary bombs.

YS-ITI blies

mple

KYS-



Ladies (bless 'em) are creatures of impulse. Show them an item that's beautiful as well as practical . . . and how they go for it!

The sales appeal of many a product\* can be traced to KYS-ITE's winning ways with women. Let us tell you, for instance, of the amazing sales record made by this maple-finish bowl. For, like all KYS-ITE, its rich, smart colorings are at home in style-conscious surroundings . . . and what woman won't applaud KYS-ITE's easy cleaning qualities, its stubborn resistance to abrasion or breakage.

#### Now for the Engineer's side . . .

Have you an unusual molding problem . . . an item that perhaps looks impossible to produce? Many an engineer, designer or manufacturer can tell you they've been in the same boat. But Keyes molded their piece in KYS-ITE . . . taking advantage of the KYS-ITE combination of properties which no other type of material can offer.

Our problem-solving experience on widely varied products should prove helpful. Why not consult us on custom molding to specifications?

AYS-ITE all-purpose bowls, radio cover asmblies, high chair trays . . . just a few
amples of how this plastic has been used
favorably influence retail buyers. Why not
KYS-ITE give your product the selling ad-

iges so necessary as competition stiffens.

KEYES FIBRE COMPANY 420 Lexington Avenue New York 17, New York Plant at Waterville, Maine KEYES

KYS-ITE

(Reg. U. S. Pat. Off.)

#### CUSTOM PLASTICS FINISHING

Able offers a complete plastics finishing service to molders who lack finishing facilities of their own, as well as to those molders who encounter problems which cannot be coped with by their own finishing equipment.

Our engineers are experienced at handling tumbling, deburring, polishing, buffing, glueing, drilling, wiping-in paint, hot stamping, hand or machine lining bottle caps and complete assembling of items. They have been successful in solving unusual finishing problems, and devising new techniques when regular methods have proven unsatisfactory. Articles custom packed and shipped direct according to your instructions.

We will gladly estimate on your custom finishing assignment. Send us either an outline of your problem or a sample part.



#### ABLE MANUFACTURING & FINISHING CO.

600 Schenck Avenue, Brooklyn, N. Y. Finishers of Plastic and Metal Products





Door advertisement's end supports are made of cellulose acetate with molded receptable for advertiser's bottle caps

#### Bottle-Cap Door Ad

A DVERTISEMENTS that are placed so that they will greet the prospective customer as he enters a store for a purchase provide effective point-of-sale advertising. For many years such advertisements have been produced in the form of decalcomanias, kickplates, and tackers. Now, a new type, designed to replace these old forms, is being made with plastic parts. Known as the Dur Ad, it is manufactured by the Eljay Corp., Baltimore, Md.

As illustrated above, the Dur Ad consists of a center panel on which an advertising message appears. Two saddle tubes with plastic supports on either side complete the new medium. The end supports have special receptacles in which bottle caps may be placed, if the advertisement is for beverages.

The center panel of the new door advertisement incorporates a piece of specially treated paper, printed with special ink laminated to a core of 0.045-in. thick phenolic under a 0.003-in. thick melamine coating. This results in a 0.065-in. thick plate that has a long life, is colorful, and is resistant to weather, oil, grease, alcohol, etc.

The end supports, which are molded of cellulose acetate, have a molded-in receptacle to hold a bottle cap. The advertisement is completed by the bottler, who simply presses his own bottle tops into the holder. The horizontal tubes are made of aluminum alloy.



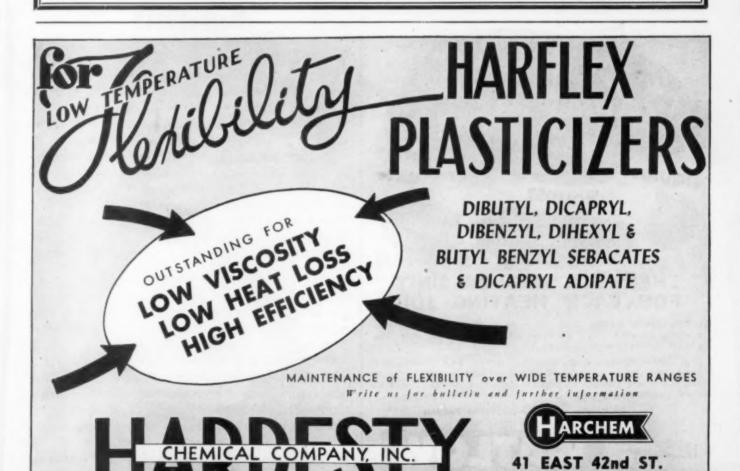
#### This Name Means Something In Plastics

For 41 years M. H. Martindell has been associated with the plastic industry. The organization which he heads combines the skill of many men with the finest equipment available. It will be to your advantage, if you are in need of plastic molding service, to "get in touch with MARTINDELL."

RTINDELL MOLDING COMPANY COMPRESSION MOLDING

INJECTION MOLDING

North Olden at Sixth TRENTON 2, NEW JERSEY NEW YORK OFFICE-1189 BROADWAY



NEW YORK 17, N. Y.

#### Why are leading plastics plants now using this



#### ATLAS Type "E"

High Pressure Reducing Valve?

Because it reduces, with ease, working pressures up to and including 6,000 lb. per sq. in. NO SHOCK whatever. And it handles water, oil, or air with equal facility. Situations that were once considered exceedingly difficult have been made simple by Type "E".

#### Let Us Explain Why:

Because ATLAS has been specializing in regulating valves for nearly a half century. We make nothing else. We know, for example, that Type "E" should have a hody entirely of forged steel — and it has. All of the internal metal parts are of

stainless steel. A formed packing of special material superior to leather is used which is immune to all fluids commonly used in hydraulic machinery. The pressure on the seat is balanced by a piston with the result that variations in high initial pressure have little effect on the reduced pressure. Complete data on request.

For other ATLAS plastics plant products see the partial list in our ad in the January 1948 issue of MODERN PLASTICS

#### ATLAS VALVE COMPANY REGULATING VALVES FOR EVERY SERVICE-

277 South Street, Newark 5, N. J. Represented in Principal Cities



#### THERE'S A WATLOW UNIT FOR EACH HEATING JOB

Watlow Electric Heating Units are made in many types, sizes and capacities for almost every job where accurately controlled, clean and efficient heating is desired.

Strip Units—Cartridge Units—Immersion Heaters—Band Heaters—Hot Plates. Wide ranges of temperatures are provided in many wattages and in standard voltages. Thermostatic and switch controls. Consult us about your heating problem.

Send for Catalog on Industrial Heating Elements





Nameplate for heater is molded of cellulose acetate butyrate; it is flexible enough to fit any size water heater

#### Flexible Butyrate Nameplate

A SINGLE molded plastic nameplate that will fit any unit in a manufacturer's line of equipment serves to identify the manufacturer in the potential customer's mind and also to coordinate sales displays of such equipment. An example of this principle is found in the cellulose acetate butyrate nameplate molded by the Southern California Plastic Co., Glendale, Calif., for a line of water heaters recently put on the market by the Continental Water Heater Co., Ltd., Los Angeles, Calif. Tenite II was chosen as the molding material because of its flexibility; the nameplate is made in only one size yet must be flexible enough to fit every size heater.

#### Molded in six-cavity die

The butyrate nameplate is injection molded in a six-cavity die, which was engineered and constructed by Southern California, and is produced from light blue material.

Continental included the flexible nameplate in a general redesign of its complete line of heaters. The new models are streamlined for beauty, yet new engineering developments, it is reported, actually increase the performance in every size water heater. The colorful plastic nameplate, according to Mr. W. R. Smith, president of Continental, "was added as another step in 'face-lifting' a functional item in the home."

WITCO CHEMICAL COMPANY

at al ste ste sis aIII

r.

a

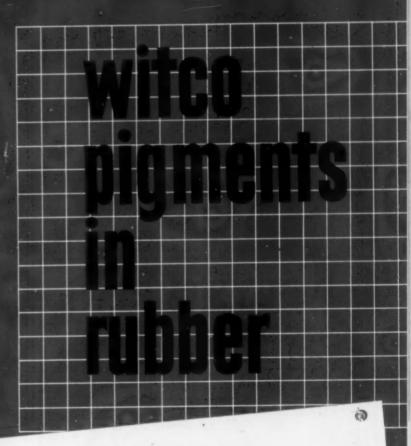
d

le

W

y r.

S



#### For Your Technical Reference Files

Newest addition to the literature published for you by the Witco Technical Service Laboratory is a 32-page bulletin, "Witco Pigments In Rubber." Write for your copy.

Comprehensive data on other specific products of significance to you are covered in our Technical Service literature on a wide range of Witco chemical products for plastics, rubber, surface coatings, paper, ink, drugs and cosmetics. Please address inquiries to Witco Chemical Company, 295 Madison Avenue, New York 17, N. Y.

## It's a jim dandy, this Anderson PORTABLE BAGGER



\* SPEEDY

\* EASY TO USE

\* LOW IN COST

Designed to handle bagged products with a minimum of effort at a maximum speed. Simple adjustment for height ... tilting forward or backward enables the operator to set machine at easiest position. Stainless steel trough with capacity of 200 bags. Adjustable to bag sizes. Blower keeps bag clean and free from foreign matter.



Write for Bulletin 11-31.

#### POLYSTYRENE

#### DECORATING LACQUER

- HIGH-SPEED DRYING
  - HIGH ADHESION
    - HIGH GLOSS

Name: "REZ-N-LAC"

Colors: All colors in Opaque and Transparent.

Uses: Spraying or painting toys. Covering

mold marks.

Will gladly exchange sample and prices for letterhead request.



Schwartz CHEMICAL CO., INC.

326-328 WEST 70th ST., NEW YORK 23, N. Y.

MODERN PLASTICS

#### Jar-Top Coaster

A TRANSPARENT closure for glass jars, molded of Dow polystyrene and designed for home reuse, is being produced by the Federal Tool Corp., Chicago, Ill., for Swift & Co., Chicago.

The closure is used for a 12-oz. jar that contains a new brand of peanut butter manufactured by Swift. The jar, which is supplied by the Hazel-Atlas Glass Co., Wheeling, W. Va., is especially designed to accommodate the plastic closure. Because of the depth of the cap, it was necessary to provide for more room between the lug and the shoulder of the bottle. A tight, but not a vacuum, seal between the container and the top is obtained by the use of a rubber gasket.

#### Closures made in four colors

The polystyrene closures, which are molded in two eight-cavity molds, are produced on 8-oz. injection molding machines. The plastic jar tops, which were designed for re-use as iced drink coasters, are made in four colors—red, amber, natural, and cocoa brown. The container, also, has re-use value—with the plastic closure—as a refrigerator jar or as a cannister.

#### Nesting principle used

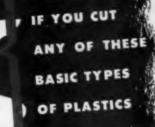
A merchandising feature of the combination is the way in which the glass jar and plastic closure follow a nesting principle of design which permits building numbers of the jars into table, floor, and shelf displays in grocery stores.

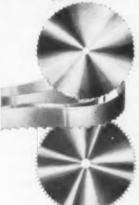
Injection molded top for peanut-butter jar, made of polystyrene, is designed for re-use as an iced drink coaster



#### important information

CELLULOSE ACETATE and BUTYRATE METHYL METHACRYLATE PHENOLIC (Cast) PHENOLIC (Laminate and Molding) POLYSTYRENE UREA (Molding) VINYL RESIN





## YOUR CUTTING COSTS



#### "Curled-Chip" Circular

Clearance construc-tion and "Curled-Chip" teeth give cooler, freer running at high cutting speeds.

#### "Curled-Chip" Plastic Band Saw

Hard-edge saw with correct clearance to leave smooth, clean. nick-free edge on material being cut.

#### "Duratio" Circular

Teeth tipped with the toughest, hardest material that can be used on any saw! Ample clearance and scientific gullet shape gives smooth, free cutting. Will not

Right from the first, plastics cutting has presented its own particular problems. Now, here are three great saws specifically designed and created to meet those problems ... to enable you to cut plastics at lower cost than ever before.

- 1. By increasing output through faster, smoother cutting. Special tooth design raises and lifts the chips in a clean curling action. Clearance construction means cooler, freer running at any speed — no "gumming."
- 2. By reducing your saw investment. Because you can standardize on just three types of saws, you cut tooling and replacement costs.
- 3. By lowering power requirements through easier, faster cutting.

These new Atkins Plastics Saws perform equally well on sheets, bars, angles, tubes or laminates ... Get the full facts from your Industrial Distributor TODAY!





E. C. ATKINS AND COMPANY

402 S. Illinois Street, Indianapolis 9, Indiana Branch Factory: Pertland, Oregen Branch Offices: Atlanta • Chicago • New Orleans • New York • San Francisco

MAKERS OF BETTER SAWS FOR EVERY CUTTING JOB

# VERSATILITY in Plastic Molding

TRY KUHN & JACOB NEXT

1200 SOUTHARD STREET, TRENTON 8, N. J. Telephone Trenton 4-5391

CONTACT THE

K & J

REPRESENTATIVE NEAREST YOU

S. C. Ullman, 55 W. 42nd St., New York, N.Y. Telephone - Pann 6-0346

T. Wyler, Bax 126, Stratford, Telephone — Bridgeport 7-4293



Whether steam or electrically heated, R. D. Wood Rolled Steel Heating Platens meet the most exacting requirements in the processing of all types of plastic and rubber products, the manufacture of plywood, wallboard, hardboard building panels, and various types of composition flooring.

Only last year, processors of plastics purchased from the R. D. Wood Company almost half of the number of steam platens bought by their industry... significant that R. D. Wood Platens meet exacting requirements. Why not have the R. D. Wood Company send you their latest data on platens and platen presses... it is yours for the asking.

Remember, when you want exacting quality in hydraulic presses, valves and equipment, call on the R. D. Wood Company.



#### Laminate in Traffic Signs

FOR more than 10 months, the city of Los Angeles, the most motorized city in the nation, has been using a new type of plastic traffic sign. Manufactured of Plyon—a low-pressure laminate of Fiberglas and a polyester resin—the signs have provided the city with "silent" police which are practical, traffic-proof, fool-proof, and wear-proof. The plastic signs, which are manufactured by the Swedlow Plastics Co., Los Angeles, Calif., are rated by city officials as able to withstand all the hazards that endanger both live and "silent" traffic police on city streets.

The greatest single advantage of these signs is their ability to take constant abuse. They can be hit, knocked over, run over, and battered, yet they emerge fresh and undaunted to carry on with their job. On the other hand, traffic signs, made from such other materials as metal and composition board, frequently have to be replaced or repaired after taking such abuse.

The durability of the laminated traffic signs has not only resulted in lower maintenance costs, but has substantially reduced the necessity of costly replacements.

The usual traffic messages, such as "Keep To The Right," "No Left Turn," etc., are stenciled on by the city with paint. The city also assembles the traffic signs to stanchions, etc.

It is reported that the example which Los Angeles has set will shortly be followed by other cities, as a result of the advantages offered by these new signs.

Plenty of abuse can be taken by these laminated signs, resulting in lower maintenance costs and fewer replacements



Plastics where plastics belong

It is a combination of chemical, electrical, physical, and mechanical properties which makes Synthane laminated plastics valuable in so many applications. Synthane is moisture and corrosion resistant, easily machined and weighs only about half as much as aluminum. One of the best electrical insulators known, Synthane is hard, dense, strong and has excellent anti-frictional qualities. Synthane is also the set plastic . . . not affected by wide variations in temperature.

Among the more domestic occupations of our type of plastics are these bushings used in Dormeyer Food Mixers.



for electrical insulation, wear resistance and mechanical strength.

The brush holder bushings (above) utilize Synthane's outstanding electrical qualities-high dielectric strength, low moisture absorption, high dielectric constant—to insulate the brush mechanism. In addition, Synthane's unusual mechanical strength helps them render long and useful service without need of replacement. These and other hard-working properties also fit Synthane for use in fans, refrigerators, washing machines, vacuum cleaners, ironers, sewing machines and many other electrical appliances.

If there's a use for Synthane in your product, let us help you with design, materials or completely fabricated parts. Write for your free copy of our complete catalog of Synthane plastics today! Synthane Corporation, 8 River Road, Oaks, Pa.



where Synthane belongs

DESIGN . MATERIALS . FABRICATION . SHEETS . RODS . TUBES FABRICATED PARTS . MOLDED-MACERATED . MOLDED-LAMINATED

#### STUMPED? By a material problem? PLAN WITH PLASTICS

SEND FOR THIS COMPLETE CATALOG



THIS COUPON BRINGS YOUR COPY

SYNTHANE CORPORATION, 8 RIVER ROAD, OAKS, PA.

Please send me without obligation a complete catalog of Synthaue technical plastics.

Company-

Address\_

City\_

Zone\_

Solve your present and future design problems with SYNTHANE Technical Plastics . Sheets . Rods . Tubes Fabricated parts · Molded-laminated · Molded-macerated. Consult us before you design and save time and trouble.

VIHANE

#### Polyethylenimine in Germany

(Continued from page 130)

ally to the liquid sodium hydroxide in the still. The reaction is quite exothermic, and was controlled by external cooling through a jacket on the still. When all the chlorethylamine hydrochloride had been added, the temperature was raised sufficiently to distill off the ethlenimine slowly. It boils at 56° C. Some free chlorethylamine boils off with ethylenimine, but this is converted to ethylenimine by the solid sodium hydroxide in the column. The ethylenimine was condensed and run to the receiver containing solid sodium hydroxide. It was transported to other operations or stored in iron containers, always with solid sodium hydroxide present, the temperature being held at -10° C. by solid carbon dioxide packed around the containers.

Recently the I. G. laboratory at Höchst developed an improved process for making ethylenimine which involves the reaction of monoethanolamine with sulfuric acid to produce beta-aminoethyl hydrogen sulfate which is treated with sodium hydroxide to yield ethylenimine:

NH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH + H<sub>2</sub>SO<sub>4</sub> →

\*NH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OSO<sub>3</sub>\* + H<sub>2</sub>O

\*NH2CH2CH2OSO + 2NaOH -

$$\operatorname{HN} \left( egin{array}{c} \operatorname{CH}_2 \\ +\operatorname{Na}_2 \operatorname{SO}_4 + 2\operatorname{H}_2 \operatorname{O}_4 \\ \operatorname{CH}_2 \end{array} \right)$$

To prepare this product in the laboratory, 915 g. of 96.0% technical monoethanolamine are introduced into 1500 g. of o-dichlorobenzene. This reaction mixture is stirred and maintained at room temperature while 1530 g. of 96% sulfuric acid is added. At the end of this addition the product is stirred an additional 2 hr. and finally heated between 80 to 90° C. During this heating period the water of condensation is distilled at reduced pressure. The water and o-dichlorobenzene azeotrope are separated and the solvent returned to the reaction flask. When 350 ml. of water, which is 96% of the water of condensation, has been removed from the reaction medium, the residual o-dichlorobenzene is removed under a vacuum and at a temperature not in excess of 100° C. The beta-aminoethyl hydrogen sulfate remains in the reaction flask as a colorless crystalline mass. A yield of 2089 g., which is 102.5% based on the betaaminoethanol, is obtained. Analysis of the product indicates it to have 91 to 92% purity and on this basis a 94% of the theoretical yield is obtained.

To convert the beta-aminoethyl hydrogen sulfate into ethylenimine, 282 g. of beta-aminoethyl hydrogen sulfate of 92% purity, 1225 ml. of water and 200 g. of a 50% sodium hydroxide solution are added to



Complete facilities for fabricating plastic parts for all industries. Estimates submitted promptly upon receipt of your blueprints or specifications.

ACE PLASTIC COMPANY

91-18 Van Wyck Blvd., Jamaica 1, N. Y.



#### MOLDS FOR PLASTIC MATERIALS INJECTION-COMPRESSION TRANSFER AND PLUNGER

We are pioneers in the plastic trade. Our modern plant is equipped to handle your plastic mold problems. Our capable staff will engineer, design, engrave, hob and harden your molds in each of our various departments.

Your molds are tested in our injection machine before leaving our plant. This new added service now assures you of perfect pieces and immediate production.

#### FORTNEY MFG. CO.

247 N. J. R. R. Ave.

Newark 5, N. J.



JERSEY CITY, N. J. • E. ST. LOUIS, ILL. • LONG BEACH, CALIF.

average molecular weight were obtained.

a 3-liter round bottomed flask fitted with a distillation column packed with Raschig rings and having mounted at the top of the column a condenser. During 6 hr. of heating there is also added at the top of the column 40 g. per hr. of sodium hydroxide as a 50% solution. After 4 hr. of distillation the product is slowly separated in the reflux column. The remaining ethylenimine distills water free at a temperature slightly above 60° C. when there is a very rapid boil up in the column. A yield of 67.5 g. (or 85.5% of the theoretical amount) of ethylenimine of 99.0% purity and boiling at 50 to 68° C. is obtained. The properties of ethylenimine and n-butylenimine are given in Table I.

#### Preparation of polyethylenimine

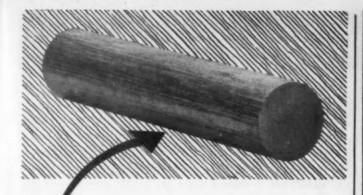
The Ludwigshafen plant polymerized the ethylenimine monomer as it distilled from the preparation kettle and by this procedure the handling of the monomer was avoided. In this operation a small amount of ethylenediamine which contained about 0.1% carbon dioxide as the catalyst was heated to 90° C. and the freshly prepared monomeric ethylenimine was added very slowly. Polymerization proceeded as the monomer was admitted to the reaction kettle; however, in some cases too high a concentration of monomer was present and polymerization of explosive violence resulted. By controlling the rate of adding the monomer to the kettle and the concentration of the catalyst, polymers of different

According to another report<sup>2</sup> the polymerization was carried out as follows: From 600 kg. of monomer held in an enameled feed tank, 200 kg. were drawn to a stirred stainless steel (V2A) kettle provided with reflux. About 2 kg. of carbon dioxide were put into the vessel, the reaction heating the contents to reflux temperature. When reflux began, the carbon dioxide feed was shut off and the rest of the imine fed in rapidly enough to keep the mass refluxing. This required 5 to 10 hr., kettle temperature reaching 100 to 110° C. and being controlled by water running through a jacket. When the product showed a viscosity of 60 to 120 sec., measured by the fall time of a 3 mm. steel ball through 20 mm. of a 50% aqueous solution of polymer at 20° C., the reaction was stopped by the addition of 1% of sodium hydroxide (added as a 30% solution) to the charge. The product was heated to 105° C., the liquids condensing in the reflux system discarded, and the system flushed out with nitrogen to make sure that no monomer was left in it. The polymer is nontoxic in this form or when applied to other materials. The 50% aqueous solution was a brownish viscous liquid.

#### Hazards of ethylenimine

Ethylenimine is very flammable, can polymerize with explosive violence, and is highly toxic. It can-

The conditions of polymerization cited here are those described in PB 48437.



S

#### FROM ROD STOCK TO SUPPORT BLOCK

That smooth cylinder of Taylor Phenol Fibre pictured above doesn't appear very complex.

But with a few deft motions in the machine shop, it becomes the hinge support block shown below . . . intricate, carefully engineered, highly specialized.

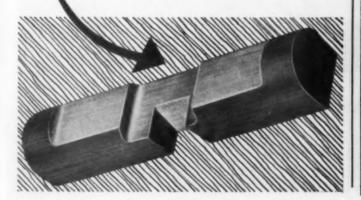
Sheets, rods, and tubes of Taylor Laminated Plastics, in various formulations, are serving industry in more ways every day. Their machineability is a paramount factor.

For a dependable source of supply for Phenol Fibre, Vulcanized Fibre, or special laminates . . . get in touch with Taylor. For fabricating service, too . . . with on-schedule deliveries . . . depend on Taylor. You'll get the kind of service that eliminates production headaches. As a starter, send a sketch or blueprint today. We'll tell you exactly what we can do for you.

#### TAYLOR FIBRE COMPANY

LAMINATED PLASTICS: PHENOL FIBRE • VULCANIZED FIBRE
Sheets, Rods, Tubes, and Fabricated Parts
NORRISTOWN, PENNA.

Offices in Principal Cities . Pacific Coast Plant: LA VERNE, CAL.



## Consult Waterbury

#### For Molded Plastics

Creative Service in Product Development.

Research, Design, Engineering.

Fine Tool and Mold Craftsmanship.

Compression, Transfer, High Speed and Injection Molding.

Finishing, Assembling and Packaging.

## Molded Plastic Packaging

Large and Small Scale Producers For Many World Famed Products.

#### SALES OFFICES

D. Gray Maxwell 17 East 42nd St. New York 17, N.Y.

B. B. Myers 223 W. Jackson Blvd. Chicago, Illinois

Leon W. Sage, Inc. 125 Allen St. Rochester 4, N.Y. R. N. Simpson 99 Chauncy St. Boston 11, Mass. John Comstock 117 So. 17th St.

Philadelphia 3, Pa. Wm. Robert Wilson Oscar Mezy 6460 Kercheval Ave. Detroit 7, Mich.

K. R. Carlson 508 Hippodrome Cleveland, Ohio

WATERBURY COMPANIES, INC. Waterbury Connecticut

## HINGE PINS

... made to your order



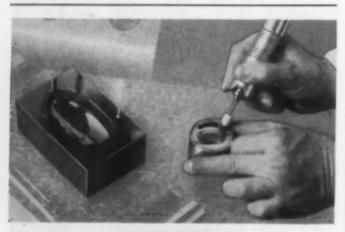


Threaded pins can be supplied to order for use as hinge pins, inserts and other purposes. They can be made quickly and economically in many metals ... with fluting, knurling or threading ... diameters from 1/32" to 1/8"lengths up to 1". WRITE FOR FREE DESCRIPTIVE LITERATURE.

#### 396 Oakland Street Brooklyn 22, N.Y.

Specialists in cold-heading . Established 1850





#### HYPREZ DIAMOND COMPOUNDS For Perfect Mold Finish

Hyprez lapped and polished plastic molds produce cerrect shape and contour with perfect surface luster — assuring longer service, greater mold production per man-hour, higher quality of finished product.

e will gladly recommend the roper grades for a complete and perfect job from our 24 en-neered standards — in seele-artridges for use with the Hyprez



HYPREZ DIVISION ENGIS EQUIPMENT COMPANY 431 So. Dearborn St., Chicago S, III., U.S.A. not be shipped except under the conditions described above, hence was normally used at the plant where it was manufactured by the I. G. However, they did transport it in cooled containers from Ludwigshafen to the Höchst plant, a distance of about 50

Ethylenimine polymerizes slowly at room temperatures: the reaction is exothermic, hence the temperature can rise and accelerate the polymerization to a point of explosive violence. This polymerization is catalyzed tremendously by acids, and even the carbon dioxide of the air is sufficiently acidic to induce the polymerization. For this reason, the product must be stored in contact with solid sodium hydroxide to prevent any local acid condition. Further, the temperature during storage was held at -10° C. by the I. G. as a further safety precaution. The polymerization also can be induced by metals; for this reason the entire manufacturing unit and all containers (including valves, etc.) were pure iron or steels, free from copper, manganese, nickel, etc.

Ethylenimine is exceedingly toxic. It attacks the skin, eyes, respiratory system, and kidneys. The first symptoms are red spots on the skin and nausea. After relatively mild exposure followed by recovery, an individual acquires extreme sensitivity to the material, and merely walking past the manufacturing plant results in a recurrence of the physiological reaction. One peculiar effect of exposure to ethylenimine is severe swelling of the head. Blonds are particularly sensitive. For protection against ethylenimine, the usual ammonia gas masks are used together with the standard precautions against escape of the material.

Despite the hazards of manufacturing ethylenimine, Ludwigshafen was producing 5 to 6 tons per month without difficulty. They did have one explosion during their early pilot plant operation, and the explosive polymerization of 5 kg. of ethylenimine threw a 30 kg. iron cover on a kettle a distance of 50 meters.

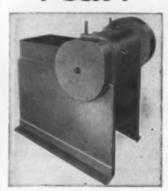
#### Application of polymer to paper pulp

For this application the polymer as a 50% solution must have good solubility in water and have a viscosity of 120 sec. as determined by the falling ball method. Products of too high an average molecular weight are too difficultly soluble to be of use and those of too low an average molecular weight (75 sec.) do not impart good wet strength to paper.

To the well-beaten and prepared pulp free of alum and in the concentration of 3 to 5% in water is added 1 to 2% of the polyethylenimine based on the dry weight of the pulp. After further mixing for 10 to 30 min., the pulp is formed into sheets or films on paper-making equipment, and dried. The pulp adsorbs practically all of the polyimine and the sheets so formed have added wet strength. A comparison is as follows:

#### Cumberland Machines for the Plastics Industry

#### now!





#### CUMBERLAND ROTARY CHOPPING MACHINE

This machine cuts slab material from compounding mills, chops continuously extruded rods. sheets or stands, and cuts up calender roll side shear strips. This machine is also used in conjunction with extrusion machines to produce cube or pel-les material suitable for a molding compound.

#### CUMBERLAND SLITTING & MANGLING MACHINE

This machine is useful primarily to manufacturers who compound plastic materials. The machine may be used to reduce material use as a commercial product without further granulating. Or it may be used to prepare material for subsequent final reduction in a granulating ma-

#### **CUMBERLAND PLASTICS** GRANULATING **MACHINES**

These machines are designed especially for plastics. They perform with high efficiency the special cutting requirements of plastic materials. They are simple in design, rugged in construction and are easy to disright (No. 14 is illustrated). Also, large 18" machine, double hung, with retractable knife block for complete accessibility. (Illustrated at right below.)





REQUEST CATALOGS

Plastics Granulating Machines.......No. 200
Slitting and Mangling Machine.....No. 300
Rotary Chopping Machine......No. 400

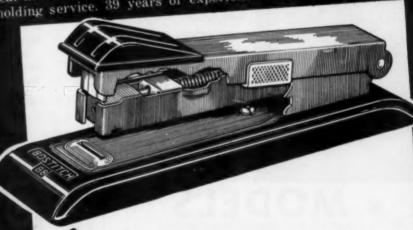
#### CUMBERLAND ENGINEERING COMPANY, INC.

Dept. (A), Box 216, Providence, Rhode Island

## "PLASTICS are Right if they're Molded by

It's no mere accident that every year more manufacturers using plastics products or parts look to Northern for complete molding service. 39 years of experience in designing, en-

gineering and molding; solving special problems of every conceivable kind; an expert knowledge of all compounds, how and when to use them, and how to mold each one best — these are sound reasons why it will pay you to team up with Northern, and learn that, "Plastics are Right if they're Molded by Northern". The plastic parts of the Bostitch Stapler are shown in black and were molded of: Base - phenolic; Striker Knob - cellulose acetate.



Northern INDUSTRIAL CHEMICAL CO.

39 Years of Plastic Molding Experience 11 ELKINS STREET, SO. BOSTON, MASS.

50. 8-4240

BRANCH OFFICES 441 Lexington Ave. P.O. Box 476

New York, N. Y.

Tel. Vanderbilt 6-1684

Rochester 2, N. Y. Tel. Charlotte 3270

P.O. Box 5404 Phila. 29, Pa. Tel. Victor 8679 Special types have been developed for each plastic

#### **Pearl Essence**



MEARL

CORPORATION

153 Waverly Place

New York, N.



#### A TRANSPARENT PLASTIC MODEL

(or housing)

is worth 1000 sales words. It demonstrates the mechanics of the device, can easily be transported and adds visual conviction to the spoken word.

For the training of men in sales or to service new equipment a transparent model will serve to teach faster and more understandingly.

#### MODELS

PRE-MOLD AND TRANSPARENT MODELS INJECTION AND COMPRESSION MOLDS

### STRICKER-BRUNHUBER CORP. Mechanical Developers

10 WEET 344 C



NEW YORK 10, N. Y.

#### Bursting strength in kilograms

Condition of paper	Untreated	2% Polyethylenimi	ine
Dry	4.0	4.0+	
Wet	0.0	1.5	

Scraps which result from cuttings, punchings, and stampings can be re-used provided not more than 10% of the scrap is added to the fresh pulp. The scrap is shredded and then slurried in water to which a very small amount of alum has been added. The polyvalent metals, such as aluminum, form complexes with the polyimines and render them inactive as far as wet strength is concerned. Therefore too much alum cannot be added to the main batch, since it deactivates additional polyimine. Scrap so treated is then added to fresh pulp, and the whole is treated with the full amount of polyethylenimine and not the required amount for only the fresh pulp.

Paper treated with the polyethylenimine has been used for a number of different applications. In some cases larger quantities of resin have been used, in order to obtain the desired result. The following uses and amounts of polyethylenimine contained in the paper can be enumerated:

Use of paper	Amount of polyethylenimine
Handkerchiefs (Kleenex type) Shoe insoles	5% 2%
Gaskets	2%
All types of absorbent papers	2-5%

#### Anchor coating for cellophane

A type of cellophane known as A.S.T. (anchored and heat sealing) comprised 90% of the production for packaging foodstuffs for war purposes in Germany. The A.S.T. film is claimed to give good performance at low temperatures and also to stand sterilization of the contents for 2 hr. at 100° C.

The anchor coating for A.S.T. film was formulated as follows:

Polimen P (polyethylenimine)	0.85	kg.
Mowilith 20 (60% solution of	polyvinyl	
acetate in ethyl acetate)	2.75	kg.
Ethyl or methyl alcohol	190	kg.
Water	10	kg.

It was applied at speeds of 90 to 120 meters per min. to give a coating of 0.1 gram of Polimen per square meter of cellophane.

The lacquer solution of 16 to 17% solids content, applied over this anchor coating, had the following composition:

Alcohol-wet nitrocellulose E730Z 77 kg

 $N_2=12.0$  to 12.2%, type of cellulose unknown. Viscosity in centipoises of a 5% solution in three parts butanol plus four parts butyl acetate plus five parts of toluene is approximately 60 centipoises; 10% solution is approximately 790 centipoises.

(Please turn to next page)

# HOW TO CUT THE COST OF SPRAYING Sunken or Raised areas of METAL OR PLASTIC PARTS

One color right after another can be wet painted before baking, on many concave, convex or irregularly shaped three-dimensional parts, with

nd

an

he

to

d.

m

m e-

in

e.

nd

ly

n

e

n

le

#### ELECTRO-FORMED METAL MASKING TEMPLATES

Clean, sharply defined letters and effects are obtained on intricately designed emblems, nameplates, automobile and radio dials, hub caps, horn buttons, and household appliance utility markings.

A thin, yet strong, lip of metal which fits accurately into the edge of the debossed areas, eliminates fogging at the edge of the

paint line, and avoids after wiping or buffing off of overspray.

By special arched bridging, the "loose" inside of letters and numerals, such as "O" and "6", are held in position to effect perfect characters without the use of the objectionable "ties" necessary with common stencils.

"ties" necessary with common stencils.

Can be fitted to fixtures on production lines. Used on hundreds of nationally known products.

Write today for further information, sample masks or

Write today for further information, sample masks or quotation on masks for parts or prints being forwarded. No obligation.

#### **CONFORMING MATRIX CORPORATION**

364 Toledo Factories Bldg., Toledo 2, Ohio



Mixers: Plain or Stainless
Preliminary or Vacuum



Watertown's complete laboratory means that your custom-molding job will be right from start to finish. Plastic pieces like these are used in developing the right compound . . . to determine tensile strength. Then, after every operation, we test the work itself. We X-ray, push, pull, twist, pound and bake it, analyze its electrical, physical, chemical and mechanical properties . . . until you, and we, know it's right.

It pays to draw on Watertown's more than 33 years experience in plastics. We'll welcome your inquiry.

Compression - Injection - Transfer Molding

THE WATERTOWN MANUFACTURING COMPANY



#### CAMBRIDGE Surface PYROMETERS

for the

#### PLASTICS INDUSTRY

The routine use of the CAMBRIDGE takes the guesswork out of surface temperature determination. Cambridge Instruments are accurate, dependable, rugged, quick-acting and easy to use. The Mold Model is for checking surface temperatures of

mol Nee inse form in a plas Roll che tem and

mold cavities. The Needle Model is for insertion into preforms and materials in a plastic or semiplastic state. The Roll Model is for checking surface temperatures of still and moving rolls.



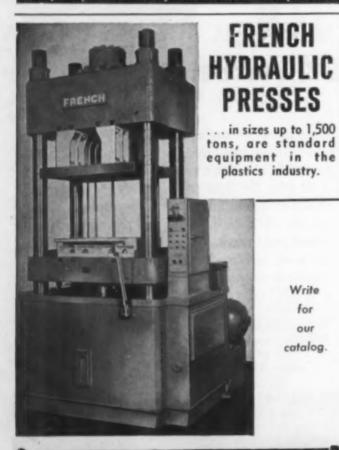


NEEDLE

Combination and single Purpose Instruments are available

and single cambridge Instrument Co., Inc. lable 3711 Grand Central Terminal, New York 17, N.Y.

Bulletin 194-5 gives details of these instruments. They help save money and make better plastics.



Special K.M. Harz Resin (I.G.)

This is 85 to 90% colophony resin plus 7 to 14% maleic acid and glycerol. The condensation is carried further than usual which results in lower acid value and darker color.

F.L.S. Harz Resin (Fahlberg List Magdeburg) 0.5 kg. Probably a condensation product of toluenesulfonamide and formaldehyde.

Alkydal RD25 (I.G. Uerdingen) 3.0 kg. This is the 25% forerun synthetic fatty acid  $C_a$ - $C_9$  plus 75% phthalic acid glycerol ester resin.

Palatinol C Softener (Dibutyl phthalate) 21.0 kg.

Dicyclohexyl phthalate 16.5 kg.

Uresin B (I.G. Höchst) 12.5 kg.

Condensation product of butyl urethan and formaldehyde.

Paraffin (M.P. 60° C.) 4.0 kg.

Solvent 494.0 kg.
Two parts benzol, one part propyl acetate; 560

#### Waterproofing fibers

The I.G. studied various types of chemical materials which will react with cellulose. Nearly all materials known at the start of their work were based on formaldehyde, and it was stated that these products cause stiffening and embrittlement of the fibers. Finally, their organization became interested in ethylenimine and its derivatives, and this was the start of what the I.G. men believe is the soundest group of water repellents and hydrophobizing agents.

The reaction of ethylenimine with an isocyanate to produce an ethylene-urea is illustrated in the setup below:

$$R-N=C=O+HN \begin{vmatrix} CH_2 \\ CH_2 \end{vmatrix} \rightarrow R-NH-CO-N \begin{vmatrix} CH_2 \\ CH_2 \end{vmatrix}$$

The important and interesting point is that the ethylenimine radical in the urea retains the reactivity toward active hydrogen compounds characteristic of ethylenimine itself. To illustrate, ethylenimine reacts with an alcohol to produce an amino ether which is as follows:

$$R-OH + HN$$
 $\rightarrow R-O-CH_2CH_2NH_2$ 
 $CH_2$ 

In a similar manner, the ethylene ureas are stated



Some of the Industries Now Served by the Combined Companies

Coatings

Printing Ink

Floor Coverings

Plywood

Paper

Rubber

Plastics

Water Conditioning

Chemical Processing

Pharmaceutical

Textile

Leather

d

Agricultural and

Sanitary Chemicals

The Resinous Products & Chemical Company is now The Resinous Products Division of Rohm & Haas Company, a merger which further strengthens the close bonds which have always existed between the two companies. No change in company policies will result from this joining of forces; the officers and executives of both companies who have worked together throughout the past 22 years will remain in their present functions.

In 1926, when The Resinous Products & Chemical Company was founded, the fields of activities of the companies were quite distinct and their separate existence permitted the fullest cooperation. But, as the companies grew with the expanding synthetic resin and plastic industry, it became apparent that the best interests of our customers would be served by combining the two organizations.

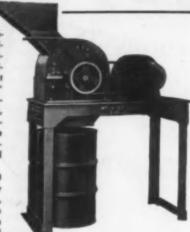
The customers of both companies will benefit from the coordinated laboratory program, the simplification of production, and other economies afforded by the joining of the two organizations. We are confident that the consolidation will enable us to serve our customers still more efficiently in the years to come.

All correspondence should now be directed to Rohm & Haas Company, The Resinous Products Division, Washington Square, Philadelphia 5, Pa.

#### "ON-THE-SPOT" PLASTICS SCRAP GRINDING is FAST PRACTICAL, ECONOMICAL with AMERICAN "KC" Grinders

Plant efficiency can be creased measurably by grinding plastics scrap at the press-es—and American "KC" Grinders are custom-built for that purposel Large capacity "KC" Grinders can be centrally lacated, accessible to all presses, or smaller capacity "KC" 's installed in specific locations to serve one or two presses, depending upon your individual production needs.

Capacities from 200 to 450 pounds per hour . . . rapidly reduces thermoplastic sprues, gates and rejects to uniform granules . , with minimum fines, assuring proper mold



Send for your copy of "Grinding Plastics Scrap Profitably"

Ring Crushers and Pulverizers

1117 Macklind Ave.

St. Louis 10. Mo.

#### DIEMOLDING CORPORATION

Canastota, N. Y.



A complete molding plant for thermoperformance established with many of the largest users of molded parts.

aid or advice in planning your molded parts.

Plastic Molders Since 1920

**IEMOLDING CORPORATION** 

to react with an hydroxyl group of cellulose, as illustrated schematically below:

Cellulose-OH 
$$+$$
 R-NH-CO-N CH<sub>2</sub>

R-NH-CO-NHCH CH -O-cellulose

If the ethylene urea is monofunctional, having been prepared from a monoisocyanate, then side chains or "tails" are attached to cellulose fibers. If the "R" in the above formula is a straight aliphatic radical of about 18 carbon atoms, then the "tails" are water repellent. This is the basis of Persistol VS. Persistol VS was selected for development because of ease of manufacture via stearic acid to stearylamine to stearylisocyanate to stearylisocyanylethylenimine.3 Furthermore, the stearyl chain seemed to be about right for maximum repellency. This seems in line with the results of studies in the United States on water-repellent materials.

On the other hand, reaction of ethylenimine with diisocyanate yields diureas. These will react with two cellulosic hydroxyl groups, probably on separate cellulose macromolecules, thus providing a crosslink. By proper selection of the diureas, this crosslinking effect suppresses the swelling of the cellulose fibers by water. This is the hydrophobizing effect. Developments may be summarized as follows:

Persistol 1/105. This is a powdered material consisting of diethylene hexamethylene diisocyanate and 2 mols of ethylenimine.3 Having a reactive ethylene group at both ends of the molecule it is capable of attaching to cellulose at two places and it is quite possible that cross linking occurs to some extent. For this reason it is claimed to be extremely resistant to laundering and dry cleaning. Persistol 1/105 is applied to the fabric from water solution without catalyst. The fabric is dried in the normal manner and then subjected to a heat treatment at 150° C. for several minutes. No after washing is necessary. Persistol 1/105 causes some discoloration of the fabric, and has a tendency to migrate while being dried.

Persistol 1/107. This is a powdered material consisting of diethylene diphenylmethane diurea and results from the reaction between diphenylmethane diisocyanate and 2 mols of ethylenimine. This compound is capable of attaching to cellulose at both ends of the molecule. It was used at the Wolfen plant in combination with Persistol VS for application to rayon yarn in the production of Vistra XTH. It is more resistant to washing than Persistol VS and can be used in combination with this product to improve the fastness properties.

Persistol 1/193. This is a trifunctional ethylenimine derivative which may be described as 2,4,6triethylenimino-1,3,5-triazine. It is one of the most

Directions for the preparation of the Persistols are given in PB 1576.



IS-

ng de If

ic

S.

se

1-

1-

to

d

h

h

e

f

ELECTRIC

CONTROL

**PUSH BUTTON** 

HANNIFIN

# Designed and Built to help you SPEED UP PRODUCTION

HERE'S help for manufacturers who want to speed up production on light stamping, press fit assembling, marking, die cutting, and similar operations. Take advantage of the opportunities offered by Hannifin's new high speed, air operated presses!

TWO MODELS: Model M-1 has 6" gap, develops 1270 lbs. ram pressure with 80 lbs. air. Model M-2 has 124" gap and 2650 lbs. capacity. Both moderately priced.

FAST OPERATION. Made possible by push button control through new electric solenoid valve. Stroke adjustable to work requirements. Every operating convenience.

QUALITY CONSTRUCTION. Built to big press standards for quality. Cylinder "TRU-BORED" and honed to satin finish. Working parts precision machined and finished. For information, see your local Hannifin representative or write for new bulletin NP-1007-P.

#### HANNIFIN CORPORATION

1101 So. Kilbourn Ave., Chicago 24, III.

AIR CYLINDERS . HYDRAULIC CYLINDERS . HYDRAULIC PRESSES
PNEUMATIC PRESSES . HYDRAULIC RIVETERS . AIR CONTROL VALVES





- Happo, an all-plastic pull toy, rolls his eyes, opens his mouth, even twirls his hat. The 17 small, intricate parts are produced by injection molding, eliminating all finishing operations.
- Happo is a good example of the cost cutting assistance that we can give you! Our engineering, design and manufacturing facilities are all keyed to make the "plastics approach" to greater profits for you. Our injection department is experienced in the molding of all types of thermo-plastic materials. And in our compression department we offer both standard and transfer methods. Your custom molds will be built in our own completely equipped tool room, assuring prompt delivery of precision parts. Write us your plastics problems today!

THE CINCINNATI ADVERTISING PRODUCTS CO.

3682 Beekman St. Cincinnati 23, Ohio



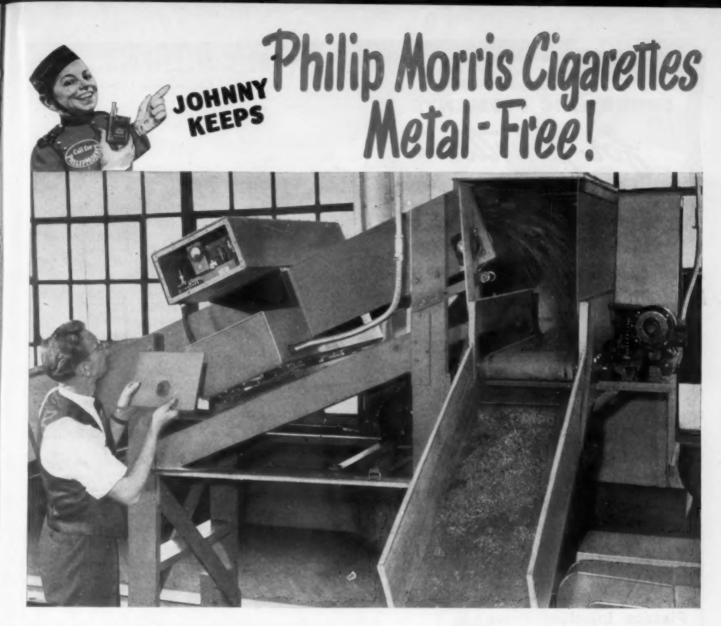
Table I.-Properties of Ethylenimine and n-Butylenimine.

	Ethylenimine	n-Butylenimine
Refractive index, n D	1.4134	1.4144
Boiling point, °C.	55	*******
Density, 20°	0.8379	0.7863
Molecular weight	43.047	99.109
Molecular refraction	12.82	31.62
Theoretical molecular refrac	ction	
for ring molecule	12.84	31.31
Theoretical molecular refrac	ction	
for chain molecule	14.39	32.86

recent developments of the I.G. in this field, and owing to a shortage of ethylenimine the work was discontinued before the evaluation study was completed. It was never applied on a practical scale. The I.G. believe that this product offers excellent possibilities as a hydrophobizing agent for rayon and as a cross-linking agent for wool. It does not discolor the fabric or migrate during drying as does Persistol 1/105. It may be used in conjunction with Persistol VS to improve laundering resistance and increase the hydrophobic properties of the fiber. The application of Persistol 1/193 to fabrics is extremely simple and the curing temperature is very low. Persistol 1/193 is applied to the fabric from water solution without catalyst. With cotton or rayon materials the solution is applied by padding. The goods may then be dried and cured in a single operation at temperatures as low as 80° C. With wool fabrics the application is best made by the exhaustion method. At a temperature of 60° C, it will exhaust into the fiber in about 10 minutes. The goods are tnen extracted and dried in the normal manner. No information is available on the storage life of this material.

#### Correction

In the article, "Scratch Resistance of Plastics," by E. G. Bernhardt, which started on page 123 of the October issue of MODERN PLASTICS, an error was made in a formula. The formula nearthe center of the first column on page 125 for determining the scratch resistance of a material, unaffected by frictional effects, was printed as  $S = \frac{A}{D}$ . Through an unfortunate transposition in the composing room, this formula is incorrect; it should have appeared as  $S = \frac{D}{A}$ .



#### ALLIS-CHALMERS METAL DETECTOR PROTECTS UNIFORMITY OF PRODUCT

THE MANUFACTURING OBJECTIVES of the Philip Morris Company have always included high standards of purity and uniformity, as well as the other qualities so essential to the full enjoyment of its cigarettes.

That's why Philip Morris has Allis-Chalmers Metal Detectors in its production line. The presence of stray metal is immediately detected... the tobacco containing it instantaneously rejected.

The Metal Detector can be used on any kind of non-metallic material . . . food, plastics, tobacco, rubber, etc. Manufacturers have found it insurance against machinery damage and loss of production time, as well as protection for customer good will.

It will spot magnetic or non-magnetic metal particles as small as .039 in. in diameter, regardless of how deeply imbedded they are. Standard units available in 2, 4, 7, and 12 inch apertures.

### **ALLIS-CHALMERS**

ELECTRONIC HEATERS AND METAL DETECTORS FOR INDUSTRY

The Metal Detector was developed by RCA Victor. Now, however, RCA's high frequency heating and metal detection equipment, its sales and service, has

been added to the Allis-Chalmers line. Thus, the combined electronic experience of two great companies is available to meet the needs of industry.



ALLIS-CHALMERS, 1124A SO. 7 MILWAUKEE, WIS.



METAL DETECTORS

Company.

Protect product quality and machinery. 2, 4, 7, 12 in. apertures. INDUCTIO

Brazing, soldering, hardening, annealing, 1 through 200 kw. DIFFER

HEATERS

der- Wood, plastics, ing, textiles, sand . 1 cores. 100 w kw. through 125 kw.

Name.....

Address

City......State:

A 2534



# PERMANENT • DEPENDABLE RESIST FADING AND HIGH TEMPERATURES INSOLUBLE IN SOLVENTS and PLASTICIZERS

Suitable for

CASTING · INJECTION or COMPRESSION MOLDING · CALENDERED FILMS AND COATING PROCESSES

LET US KNOW THE APPLICATION

B. F. DRAKENFELD & CO., INC. 45-47 Park Place, New York 7, N. Y.

#### Drakenfeld

# New MOSLO Minijector UNIVERSAL 1½ oz. HYDRAULIC



Write for Details and Prices

MOSLO MACHINERY COMPANY

2443 Prospect Ave.

Cleveland 15, Ohio

#### **Fhermal Effects**

(Continued from page 128)

assumed that the maximum continuous service temperatures of these laminates is determined by the intersection of the S/T curves with the thermal exposure effect curves, and further that the flexural strength should not fall below 60% of its initial value as measured at 25° C. after exposure to other temperatures, the maximum application temperatures for continuous service of the various grades would be as given below:

Grades C and X ...... between 85 and 95° C. Grades AA and Fiberglas phenolic ...... between 135 and 145° C.

These temperatures check well with actual practice. The values for flexural strength, elastic modulus, and thermal coefficient of resilience are compiled in Table VI, below, to give a qualitative comparison of the laminates. In accordance with their net thermal stability, covering the properties of flexural strength, elastic modulus in bending, and resilience, these laminates can be listed in order of superiority as follows:

- 1. Fiberglas-phenolic
- 2. Asbestos-melamine
- 3. Grade AA
- 4. Grade C
- 5. Grades XX, LE.

Table VI.—Comparison of Properties and Thermal Stability of Laminates\*.

Property	Grade AA	Grade X	Grade XX	Grade LE	Grade C	Fiberglas- phenolic	Asbestos- melamine
Flexural strength	2	2	3	3	3	I	2
Thermal stability of flexural							
strength	1	4	3	3	2	2	1
Modulus of elastic	C-						
ity in flexure		2	3	4	4	1	2
Thermal stability of elastic							
modulus	2	4	4	4	3	1	2
Resilience	3	3	4	2	2	1	3
Thermal stability of resilience	3	- 3	2	3	1	2	1
Maximum appli- cation temper- ature for con- tinous service,							
	45	95	****	2222	95	145	****

\* Highest order of superiority is indicated by 1, next highest by 2, etc.





If you missed seeing our booth, please

visit our showroom at any time.

### Finest COUNTER AND TABLE TOPS

WAtkins 9-3030-1,2,3,4

FARLITE counter and table tops are unsurpassed for beauty and durability. Resist abrasion and impact. Stain-proof, highly warp resistant, not harmed by hot dishes, scalding liquids, fruit acids, household chemicals and alcohol. Appealing luster and beauty are retained for years! Available in wide variety of pastel shades, linen, wood, marble, and pearlescent. Sizes up to 36" × 86". 5-ply crossbanded construction.

#### Finest TIVE LAMINATED PLASTIC

FARLITE, laminated plastics material, has thousands of uses. Decorative FARLITE is the last word for interior and exterior applications . . . door panels, wall and ceiling, window ledges, coaches, buses, airplanes, etc. Industrial FARLITE is especially suited for die-punching, sawing, shaping and hot stamping. Has high dielectric strength — volume resistance — low moisture absorption.

Write today for full details!

FARLEY & LOETSCHER MFG. CO., Dubuque, Iowa

#### THE PLASTISCOPE"

INTERPRETATIONS OF THE CURRENT NEWS

By R. L. VAN BOSKIRK

#### Polyethylene for packaging

WITH the expected production capacity in polyethylene, or Polythene, as it is called by E. I. du Pont de Nemours & Co., Inc., slated to grow from its present less than 15,-000,000 lb. annually to a production rate of somewhere around 55,000,-000 lb. when the Du Pont and Bakelite plants are completed late this year, the interest in this comparatively new plastic is mounting with ever-increasing intensity. There are enthusiastic users of the material today who predict that there will be a demand for several hundred million pounds annually within the next four years. One extruder claims to be using at least 2000 lb. a day. Authorities say that its potential low-cost and utilitarian possibilities give it prospects of becoming one of the three or four greatest poundage items in the plastics industry.

Polyethylene has rather broad utilitarian applications, particularly in the electrical field, but at this moment interest is also directed to its further development as a film for the packaging industry.

The characteristics of polyethylene which make it desirable for frozen food packaging were discussed in these columns in June, but developers feel that it is a natural all-around packaging film which will fit into many other applications. Up until recently it was disregarded as a film for pre-packaging fresh foods and vegetables because it did not permit "breathing" of the contained article. Its water vapor transmission rate of 0.6 to 0.8 grams per 100 sq. in. in 24 hr. for 2-mil film is the lowest of any plastic except saran, which is 0.2 to 0.3 for the same thickness, and this, of course, is a most desirable characteristic for many kinds of packaging.

However, it is now believed that polyethylene film could be perforated so that oxygen would pass through the film more readily, yet the water-vapor transmission rate would remain essentially unchanged, thus allowing "breathing" while preventing dehydration. Fresh fruits and vegetables react differently in various kinds of packaging; what

may work for lettuce or spinach might not work for apples or peaches. It is believed that polyethylene could be successfully used for as many products as any other film if the idea of perforating can be satisfactorily carried out.

Cost comparisons-In cost, polyethylene compares favorably with other materials. For example, a 2mil extruded film at 75¢ a lb. would give 1000 sq. in., for a cost of 5 cents. Moisture-proof, water-resistant, heat-sealing cellophane in 1.4 mil thickness is 4.8 to 5.6¢ per 1000 sq. in. after the recent price raise. Saran film, which is also a good possibility for many types of packaging because of its particular properties, including strength and chemical resistance, would cost in the neighborhood of 12¢ for 1000 sq. ft. of 2-mil film, but experimenters point out that it is being developed for special uses rather than for the general field.

Most polyethylene film so far used for packaging has been extruded although there is considerable experimentation with cast film which would give greater transparency and other improved properties; but the price would be about \$1 a pound.

Coating over paper—Polyethylene is also being used successfully as a coating over paper. It seems to work out as a coating better than as a laminate because of the difficulty of obtaining good adhesion.

One of the handicaps in the de-

velopment of uses for polyethylene has been the problem of heat sealing. The material is difficult to heat seal because of its waxiness, the ease with which it will melt when exposed to high temperature, and its low-loss characteristic in a highfrequency field. Nevertheless, progress is being made in overcoming these problems, and thousands of dollars worth of heat-sealed polyethylene products are on the market. One of the ways to aid heat sealing is to coat the jaws of a heat sealer with Silicone grease which is often used as a mold release compound in other segments of the plastics industry. Silicone rubber or a 10-mil covering of Teflon have also been used over the jaws of the machine to prevent the polyethylene from sticking.

The above-mentioned heat sealing problem centers around polyethylene's tackiness when it is hotin other words, it sticks to whatever happens to be adjacent to the material. As far as heat sealing is concerned, it can be actually done with a flat iron, if paper is used to protect the polyethylene from the hot iron surface. Cellophane also can be used as a slipsheet and it pulls away smoothly when the sealing is completed, but any such process is expensive in commercial application. It has been stated that the use of slipsheets increases handling costs by 50 percent.

So far, no one has reported a high-frequency sealer in actual use. Polyethylene has such a low loss factor that it presents a difficult problem when attempts are made to heat seal it electronically. It can, however, be sealed by any high-frequency generator by facing the jaws with acetate or comparable high-loss material.

Difficulty in printing—Another factor involved in the development of polyethylene as a packaging material has been difficulty in printing due to its waxy surface. However, several of the foremost packaging manufacturers, who are experienced in handling problems of this kind, assert that they have conquered this problem by using specially prepared inks. The printing problem is not one for an amateur nor one that the average printer can handle without considerable experience.

Among the recent developments in polyethylene packages are a package for peat humus in which the humus will remain intact indefinitely without deterioration, as compared with a former package made from paper or cardboard that was destroyed by the organic activity inherent in the peat; use in a multi-wall bag for packaging citrus fruits that were formerly shipped in crates—the new bag saves space and refrigeration; bags for holding 60 lb. of frozen cream for crosscountry shipment; bags for packaging poultry; bags for shipping freshly cooked shrimp from the coast to inland cities by air; bags for cut

<sup>\*</sup>Reg. U. S. Patent Office

#### Sure Cure for Finishing Room Headaches ...



packs your product with the proved salesappeal of a hammered-metal-like finish... reduces rejects...helps finishers stay out of trouble because it's so simple to use

If you're looking for a finish that's easy to apply, yet gives your product that "look" that appeals to buyers — Hammertone is your answer.

Available in practically all colors, Hammertone can be sprayed on either metals, wood or plastics with equal success. It bakes or air dries to a tough, smooth finish with the striking appearance of hammered metal. Weld marks and small surface defects are hidden by Hammertone, which — in addition to its uniform results in application — reduces rejects to a minimum.

For further information, write for Technical Data Bulletin #115 or ask your M&W representative. Color card is available.

IN PROTECTION

M&W.C? 1876

... where industry goes with finishing problems

MAAS

#### & WALDSTEIN COMPANY

NEWARK 4, NEW JERSEY

Boston 15, Mass. • Chicago 12, III. • Los Angeles 34, Calif.

Pacific Coast Division: SMITH-DAVIS CO., 10751 Venice Boulevard, Los Angeles 34

ANUFACTURERS OF INDUSTRIAL FINISHES

#### THE PLASTISCOPE

flowers; and bags for blankets. Another interesting use is as a liner in steel and fiber drums, which is particularly effective in chemical shipments. Still another different application in the packaging field is the use of polyethylene for bottle cap liners. Also, the material is now widely adopted for closures and blown bottles.

Constant improvement in the technique for handling polyethylene will undoubtedly increase the number of applications for which it may be used. Furthermore, Du Pont is known to be experimenting with a chlorinated polyethylene which will be superior in certain properties such as flame resistance, particularly for insulation and other applications, and in drape and elasticity for use in film.

#### New thermoplastic compounder

A FTER several years of development, a new machine for compounding various plastics materials is just about ready for marketing. Called the Millstruder, the machine is a product of the National Rubber Machinery Co., Akron, Ohio. It is a continuous plastics mixer and extruder and will be useful for compounding all types of thermoplastics.

The Millstruder combines the principle of a mill with that of an extruder; in other words, after plasticizer, pigment, and resin have been tumbled in a barrel or rough mixer, they can be placed in the machine in granular or powder form and come out fully processed through an extrusion die.

The machine differs from all other types of extruders in that it contains milling rolls which are smooth and polished-the flights are on the lining of the chamber, and the outlet may be on the bottom or on the side. The material is introduced into the machine through hoppers at each end of the chamber. It is thought that a better compound can be obtained this way than in any other heretofore known method because there is a more intimate mixing and milling action. There is greater heat concentration because advantage can be taken of frictional heating.

In the older methods, it was frequently necessary to use both a mill and a Banbury mixer and then put the material into an extruder. The

present machine has run as much as 400 lb. of compound per hr. with 4-in. milling rolls. The price of the machine is comparable to that of a medium priced extruder.

Of the machines now operating, one is feeding a calender; one is extruding a thin film through a slit die several inches wide; and others are used for continuous polystyrene coloring. Milling time for coloring polystyrene by conventional methods at present is about 20 min.; adding a Millstruder gives a cycle time of 6 min. for this operation because it is able to heat up the material at a faster rate.

#### Polystyrene in automobiles

NINE 40-oz. injection presses have been ordered by Nash-Kelvinator Corp., for delivery to its Milwaukee, Wis., plant. The presses are being delivered one a month, starting last September. It is presumed that they will be used for molding large refrigerator pieces although the recent appearance of the new Nash automobile with a large part of its dashboard molded in polystyrene may indicate that these pieces will also be molded by Nash. The automobile job, weighing over 30 oz., is in three rectangular pieces that set vertically on the dashboard. The pieces are treated with Logoquant, a liquid designed to improve solvent resistance and reduce electrostatic attrac-

It is reported that the horn button on the Nash has been molded in polystyrene for the last 8 years and has apparently given satisfaction. It seems highly significant that polystyrene should now be entering the competition for trim and ornament parts in automobiles where it has been scarcely used up until this time.

#### P.M.M.A-M.I.T. movie

A FEATURE of the Third National Plastics Exposition in New York was the first showing of a motion picture demonstrating the development of the research project in plastics sponsored by the Plastic Materials Manufacturers Association in the laboratories of the Massachusetts Institute of Technology.

The film shows the development of the M.I.T. project and gives a good idea of what is being attempted in the research program devoted to the mechanical properties of plastics and the molecular changes induced by stress.

The benefit of this research to consumers is illustrated in the final portion of the film through a rapid montage of prize-winning manufactured plastic products—the award entries in the 1948 MODERN PLASTICS Competition.

This 16-mm. sound and color film takes approximately 20 min. to run and will be made available to groups that are interested upon application to the Plastic Materials Manufacturers Association, Tower Bldg., Washington, D. C.

#### Interlake ceases phenolic molding powder production

PRODUCTION of phenolic molding compound by Interlake Chemical Corp. has ceased. The company decision follows destruction of its Waltham, Mass. molding powder plant (formerly Makalot) last April. Since that time the company has been working with Monsanto Chemical Co. to fill orders but has now terminated that arrangement.

Plans have been prepared for a new plant at a different location, but because of the high cost of construction, the final decision as to when and where the new plant will be built has been deferred. The company will continue to manufacture liquid resins as in the past.

#### Urea standard colors

WHAT is seen as a long step forward in the standardization of plastics colors has been announced by the Plaskon Div. of Libbey-Owens-Ford Glass Co., American Cyanamid Co., the Plastic Materials Manufacturers' Association, and the National Bureau of Standards, who have all cooperated to establish 17 standard colors for urea formaldehyde plastic molding materials.

The aim of the program is to reduce inventory of hundreds of different colors maintained by molders and material manufacturers. The 17 colors were chosen after considerable study as having the most widespread acceptability in the fields served by urea plastics. It is believed that as much as 50% of urea production will eventually be in the standard color group.

Samples in the form of molded chips are being distributed to molders and may be obtained from the

#### Low Cost Degating!

#### with B & D SMALL DEGATING PRESS

d 0

d

ıl

d

d

This press fills the need for a small press to take care of light work. It is ruggedly constructed for smooth, quick degating of your pieces at low cost. Quickly set up. Has a capacity for a wide variety of work. Consult our engineers for degating dies to your specifications.

Other B&D Equipment 2 Types Saws Swedging Presses Meshed Cutters Automatic cut-off machines

Send For Bulletin on B&D Family of Plastic Accessories.



#### BARKER & DAVIS MACHINE CO., INC.

91 Mechanic Street

Leominster, Mass.

#### ORGANIC PEROXIDES

TERTIARY BUTYL HYDROPEROXIDE TERTIARY BUTYL PERBENZOATE DI-TERTIARY BUTYL DIPERPHTHALATE TERTIARY BUTYL PERMALEIC ACID TERTIARY BUTYL PERPHTHALIC ACID 1-HYDROXYCYCLOHEXYL HYDROPEROXIDE-1

Now available in addition to:

**LUCIDOL** 

LUPERCO\*

ALPEROX\* C (TECHNICAL LAUROYL PEROXIDE)

LUPEROX\*

LUPERSOL\*

(PEROXIDE SOLUTIONS)

SPECIAL ORGANIC PEROXIDES

-REGISTERED

TRADEMARK

LUCIDOL DIVISION

> NOVADEL-AGENE CORPORATION BUFFALO 5, NEW YORK



Not a thing, Mister!

As far as we're concerned, it's perfect. (But if you're trying to make a call . . . sorry, it's not hooked up!)

You see, our job (here at Newark Die Company) was to machine the molds for this phone. We did the work for I. T. & T.'s Argentine subsidiary, who manufacture up-to-date equipment for the country's modern telephone system.

Specifications for this job were received in metric system—and were then translated into linear for the sake of precision. Once accomplished, skilled craftsmen at The Newark Die Company proceeded to pro-

duce a set of molds exemplary of our high-quality workmanship.

In our 25 years of serving the plastic industry, we've turned out thousands of compression, transfer, and injection type molds-and to perfection. That's why we're qualified to solve any multiple-cavity-mold problem you may have.

If you need our help (or just thinking), we'd like to talk with you.



TOP HALF OF MOLD



BOTTOM HALF OF MOLD

	Just tear out this coupon and mail it to us.
THE PROCESSES	Please send me a free copy of "The Procedure of Die Hobbing."  Name
	CityState

#### NEWARK DIE COMPANY

22 SCOTT STREET



NEWARK 2, N. J.

#### THE PLASTISCOPE

Plastic Materials Manufacturers' Association, Tower Bldg., 14th and K Sts., N.W. Washington, D. C. The standard colors will bear the designation MUP (molded urea plastic) followed by numbers designating particular shades. Through this color standardization, molders can now be assured that colors from different suppliers bearing the same MUP designation will match.

Prices for standard materials range from ½ to 17½¢ per lb. lower than for non-standard, made-to-order colors, depending on quantities ordered. Price schedules may be obtained from the two distributors.

#### Laminate price increases

A PRICE increase on paper base industrial laminates ranging from 5 to 10% was announced recently. There has been no change in fabric laminates since the price in that particular branch of the industry was raised last May.

The current increase is due to higher costs for paper and labor, which have gone up considerably since the end of the war with no parallel raise in the price of the finished laminate.

A sample of current prices of both paper and fabric laminates is:

	Old	New
X grade	\$ .58/lb.	\$ .78/lb.
XX grade	.72	.80
Canvas grade	1.12	1.12
Linen grade	1.46	1.46

There are scores of variations in this price structure due to different company policies and variety of products, but, in general, the above prices give an idea of the comparative change in the price structure.

Business picks up—After a decline in business that was all too obvious last Spring, there has been a considerable pickup this Fall, even though industrial laminators claim that the industry could probably fill orders for at least 30% more business than it is now handling. For example, one leading company says that its coating department is still shut down one day a week although it is more economical to operate around the clock every day of the week.

The estimate departments of various firms are particularly busy, and

one company man says that the reason may be that the Government seems to be placing orders for laminates with firms who had not previously dealt with the Government on this material; consequently, the manufacturer who furnishes the laminate is required to make repeated estimates because of the unfamiliarity some of his customers show in relation to his products.

There has also been a change in dollar volume in the industry because a great portion of the work has changed from fabric-filled to paper-filled laminates. During the war the ratio was about 3 to 1 for fabric-filled laminates, but today that ratio is reversed in favor of paper-filled laminates. The paper laminate is not as costly and, consequently, creates a difference in the dollar volume as compared with war-time operation. Furthermore, the industry is providing a large percentage of full sheets today in comparison to smaller pieces a few years ago, and that practice also has a tendency to lower dollar volume but increase poundage.

Through June of this year, the amount of phenolic resin used in laminates was about 18,000,000 lb., in comparison with 21,000,000 lb. in the same period of 1947.

#### Rubber-phenolic compound

VIDENCE of the increasing use of rubber with phenolics is indicated by the recent General Electric announcement that the company is now marketing a new Hycar phenolic molding powder. Particularly applicable to products requiring high shock resistance, the compound is recommended for instrument cases, knife handles, power tool handles, and any other application subjected to rough treatment. The new compound possesses the good moldability and heat-resistance of wood flourfilled phenolics and is strengthened by the toughness and resiliency of Hycar, an acrylonitrile or Buna-N type rubber, which is a product of B. F. Goodrich Chemical Co.

General Electric asserts that the material can be used to replace cotton flock and rag filled compounds for many applications. Its outstanding properties, according to the producer, are: an impact strength many times that of standard wood flourfilled phenolics; low bulk factor; pourability; good finish; capacity to be rapidly preformed in automatic equipment; an inherent resiliency which permits it to be molded around large, complex inserts without cracking; and an excellent thermal shock resistance. The material is called G-E 12446.

#### West Coast University acquires P.I.T.I.

THE Plastics Industries Technical Institute has disposed of all its laboratories, buildings, and other assets to West Coast University. There will be no changes in personnel or training methods, according to John Delmonte, who continues in his position as technical director of the institute. He will also assume a faculty chair in West Coast University's engineering college.

With the combined facilities of the university and the institute, education in plastics engineering and technology will be offered on three levels, according to Ralph Hemphill president of the university in Los Angeles. These are as follows:

Resident students may take an intensive four-month course which qualifies them as plastics fabricators. Eight months of additional advanced training prepares students for employment as plastics technicians.

Resident students may take a comprehensive course in mechanical engineering, specializing in plastics processing, and obtain a Bachelor of Science degree.

A one-year home study course in plastics is available for students who cannot take or do not desire resident student training.

West Coast University's engineering course is designed to fit an "industrial" pattern. All students attend classes from 8:00 a.m. to 1:00 p.m. daily, allowing them time for work in allied industries during the afternoon. There is no long Summer recess, and students seeking Bachelor of Science degrees can reach their objective in three years.

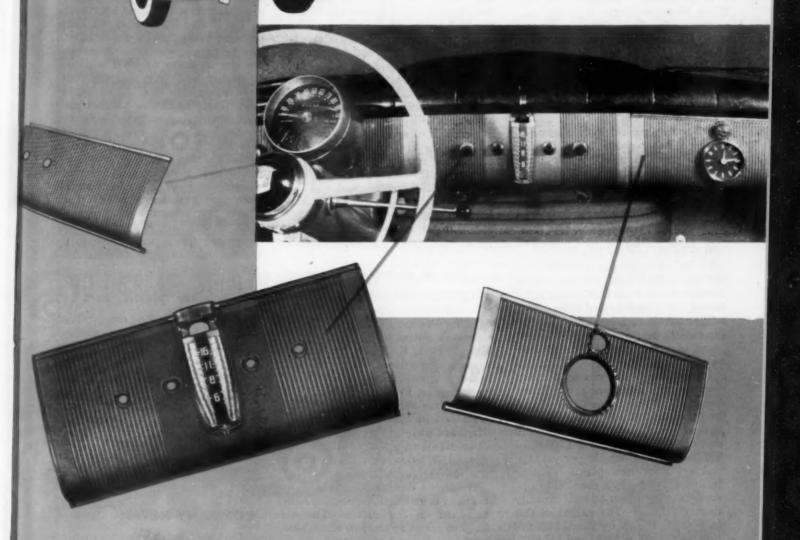
#### Merger

THE Resinous Products & Chemical Co. has been merged with the Rohm & Haas Co., Philadelphia, Pa., and will be known as the Resinous Products & Chemical Div. of Rohm & Haas. The relationship between the two firms has always been close, with controlling stock interest in both companies held by the same group and manufacturing and selling operations closely interrelated. Otto Haas, president, says that the

Mask CHOSE

STYRON!

for economical adaptability



The '49 Nash sets the pace with a new STYRON (Dow Polystyrene) instrument panel. The originally designed instrument panel looked good on paper—BUT to prove practical, it had to be constructed of a material that was (1) adaptable to Nash's new "cockpit control" and (2) economical enough to use on a very large scale. Nash chose STYRON. The versatility of STYRON solved many of the interior designing problems. The low cost and high quality of STYRON permitted its use in mass production. STYRON, America's number 1 plastic, again has proved itself the right plastic for the right job.

PLASTICS DIVISION, DEPT. T-43

THE DOW CHEMICAL COMPANY . MIDLAND, MICHIGAN

New York • Secton • Philadelphia • Washington • Cleveland • Detroit Chicago • St. Leuis • Houston • San Francisco • Los Angeles • Seaffle Dow Chemical of Geneda, Limited, Teronto, Canada



#### THE PLASTISCOPE

merger will enable the two companies to simplify their operations and do a better job of serving the customers of both firms.

The following officers have been named: Otto Haas, president; Duncan Merriwether, executive vice-president; C. E. Andrews, A. L. Blount, R. A. Connor, L. W. Covert, D. S. Frederick, E. L. Helwig, and L. Klein, vice-presidents; S. C. Kelton, secretary; W. T. McClintock, treasurer; J. F. Bergin, P. J. Clarke, William Kohler, assistant secretaries; T. V. Monahan, George Schnabel, assistant treasurers.

#### Formaldehyde shortage ends

THE acute formaldehyde shortage, which has existed for the past several years, is ended, in the opinion of capable observers. The chief reason is the increasing supply of methanol, from which the major part of the country's formaldehyde is produced.

Methanol capacity has increased within three months from 82,000,000 gal. a year to approximately 140,000,-000 gal. per year. Despite the strong demand for this chemical as an antifreeze, it is anticipated that there will be adequate methanol to supply formaldehyde producers with sufficient raw material for some years to come.

In addition to improvement in the raw material situation, several new formaldehyde producers have come into the picture, and plants are now being constructed to increase the country's capacity to over 1,000,000,-000 lb. of formaldehyde per year.

Apart from new plants, existing facilities will be in a position to operate at much closer to total capacity than heretofore. The extent of this increase is shown by the 523,000,000 lb. production in 1943, and 515,000,-000 lb. in 1947, and the current rate of 700,000,000 lb. per year. Generally speaking, this quantity of formaldehyde will require about 65,000,000 gal. of methanol, but one of the largest producers, the Celanese Corporation of America, manufactures formaldehyde by direct oxidation of petroleum gases and is, therefore, independent of methanol as a raw material. Even assuming that all the formaldehyde made was from methanol, 65,000,000 gal. is only 46%

of the methanol capacity, a figure not very much out of line with the end use pattern for this particular material

Use in plastics-From the consumption point of view, probably 85% of the formaldehyde produced goes into the manufacture of thermosetting resins. The largest of these is the phenolic type, future expansion of which is severely handicapped by the shortage of phenol. This shortage shows no sign of lessening for a number of years to come because of the dependency upon benzene from coal tar distillation. Melamine and urea resins also employ formaldehyde and will probably expand but not enough to create any great disturbance in the contemplated formaldehyde supply situation.

Between the slackening of the rate of demand, therefore, and the increasing availability of formaldehyde, it appears that any shortage of this material is extremely unlikely, at least for the next few years.

#### Art on shower curtains

NEW series of designs for shower curtains are being shown by Starling Products, a new organization with offices at 37 W. 28th St., New York 1, N. Y. The series will feature adaptations from art masterpieces reproduced by hand silk screening on Firestone's Velon film. First of the series is a water scene from two of Van Gogh's paintings. They are done in four combinations of color, all on a frosty white background. Window curtains to match the shower curtains are available.

Another design presented by Starling is an initial monogram hand screened on the curtain. The old English script appears in wine, blue, or black framed in a silver scroll. Matching window curtains with a silver ruffle are included.

#### New extruder

A NEW extrusion machine will soon be put on the market by The Standard Machinery Co., Mystic, Conn., according to an announcement by Ben Davis, who was recently appointed sales manager of the company. Mr. Davis is a former representative of John Royle & Sons,

well-known extrusion machine producers, as well as of the McNeil Machine & Engineering Co., and the Hartig Engine & Machine Co.

Mr. Davis says that his company's line of extruders will include machines for the plastics, rubber, wire, and cable industries. Edmond Spencer, formerly with the American Locomotive Co., Commonwealth Steel, and The Electric Boat Co., has also joined the organization as mechanical designer.

#### Rat-repelling plywood laminate

OFFERED under the trade name of Protekwood, a new low-cost plywood laminate has been announced by the United States Plywood Corp. as being exceptionally rat-repellent. The board is especially recommended for use on farms where it will help to protect poultry, grain, etc., from devastation by rats. It would be particularly applicable for such uses as liners for silos, grain bins, egg rooms, hen houses, and in ventilation flues or in air tunnels used in barns.

The new material is a hardwood veneer sandwiched under extreme heat and pressure between paper sheets that have been impregnated with asphalt and Vinsol. The impregnated sheets are bonded to the veneer with a urea formaldehyde synthetic resin glue.

#### Another "plastic" car?

NOTHER of the often-talkedabout but as yet unproduced
"plastic" automobiles is now announced as in the planning stage by
Airways Motors, Inc., San Diego,
Calif. Plans call for a rear-engine
car to sell in the \$750 price range;
the firm claims the car will have a
speed of 50 miles an hr. and will run
50 miles per gal. of gas. Company
publicity says the car will be constructed largely of plastic and aluminum.

#### **COMPANY NEWS**

Carbide and Carbon Chemicals Corp., 30 E. 42nd St., New York 17, N. Y., has announced large-scale production of five new vinyl ethers in addition to the three already in commercial production. The eight compounds now include vinyl methyl, ethyl, isopropyl, n-butyl, isobutyl, 2-methoxyethyl, 2-chlorethyl, and 2-ethylhexyl ether. These vinyl ethers can be polymerized in either the liquid or vapor phase. With other monomers, copolymers are obtained. Vinyl ether polymers

# NOTICE Dispersion Coatings

● The Pittsburgh Plate Glass Company offers to license manufacturers and users of organasol coatings under the following United States Letters Patent Numbers:

2,379,236

2,379,237

2,392,135

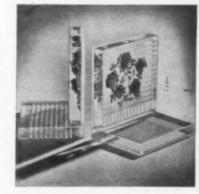
**Reissue 22,812** 

For further information and a copy of the Standard License Agreement, write Pittsburgh Plate Glass Company, Paint Division, 2000 Grant Building, Pittsburgh 19, Pa.

#### Custom Effects

#### TO INCREASE YOUR PLASTIC SALES

Beautifully colored internal carving will increase your sales of plastic products.



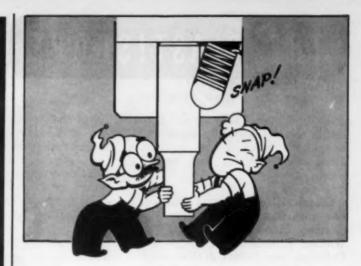
Graduates of Enterprise are trained to do internal carving and coloring for you. Beautiful plastic bookends—fabricated, hand carved and colored by Enterprise students.

Men are immediately available for jobs or contract work.

Placement Service

#### ENTERPRISE SCHOOL OF PLASTICS

81 WILLOUGHBY STREET, BROOKLYN 1, N. Y. MAIN 5-0743



# PUNCHES & DIES are SECURELY POSITIONED because they're LOCKED!

Once inserted . . . a simple matter of a push and a twist . . . R-B punches and dies stay in place, accurately positioned both vertically and radially for perfect alignment with the mate. Spring-held ball bearing locks in R-B retainers prevent all movement of punches and dies until released.

Because R-B products are made from selected steels with closely controlled hardness, finish and tolerance, they are all uniform and interchangeable. R-B interchangeability also lowers punch and die inventories and enables press operators to make quick changes so that press "down time" is kept at a minimum. These R-B advantages, fully proved by years of varied production use, are a few of the reasons

R-B ADVANTAGES

- Simple in design and construction.
- ✓ Saves time and money in die building.
- Unlike most parts used in die construction, R-B products have a salvage value.
- V Punches and dies of standard sizes, shapes and materials carried in stock for immediate delivery.
- Special punches and dies made promptly to your specifications.

why R-B punches and dies are now "standard" in the metal-working and plastics industries.

WHOLE STORY
IN THIS FREE
CATALOG



A 48 page book containing full information on Allied's "one stop service." Write for your copy.



#### **ALLIED PRODUCTS CORPORATION**

Department 25 • 4622 Lawton Ave. • Detroit 8, Michigan

#### THE PLASTISCOPE

and copolymers vary from hard resins to soft, internally plasticized compounds, valuable for coatings, films, and molding and casting resins.

Chemical Div., Koppers Co., Inc., has opened an office in the Mc-Kerchey Bldg., Detroit, Mich., with William V. DeGalan in charge. Mr. DeGalan was formerly chief engineer and plant manager for Detroit Development and Manufacturing Co.

Myler Plastics Corp., 92 Bishop St., Jersey City, N. J., has announced the election of Isaac Clayman, former general counsel, as president of the company. Morris Gladstein, general manager, has been elected vice-president in charge of sales and research and also elected to the board of directors. E. W. Myler, former president, has resigned because of ill health. Lester Livingston has also resigned as executive vice-president because of outside interests.

Heribert, Inc., 3501 Riverdale Ave., New York, N. Y., has announced a new line of Heribol inks for printing on polyethylene. In either standard or specially matched colors, these inks can also be used on saran and Pliofilm. Special thinners and retardents to give varying drying characteristics are also available.

Tech - Art Plastics Co., 42-33 Northern Blvd., Long Island City, N. Y., has announced the election of Donald Havens, formerly vice-president and treasurer, as president, replacing Valentine B. Havens. Other officers elected and executive appointments include: Robert Clochessy, formerly assistant general manager was elected treasurer and general manager; Harry W. Treckman, assistant treasurer; Herbert A. Tighe continues as secretary; Edward V. Walsh continues as general sales manager and was elected assistant secretary.

The Panelyte Div. of St. Regis Paper Co., has adopted a new sales policy for its decorative plastic sheet based on exclusive distributorship. Each distributor is being granted a definite sales territory in which his warehouse stocks shall be the only such stocks of Panelyte decora-

tive in that territory. While he may ship outside his territory, it must be from his own warehouse stock. The agreement stipulates that no distributor may engage in the manufacture or assembly of any article which incorporates Panelyte decorative sheet as a component part.

Lupo Research Laboratories has moved the company's laboratories to larger quarters at 9 N. West St., Mt. Vernon, N. Y.

Nixon Nitration Works, Nixon, N. J., has announced that F. W. Lindahl, who formerly covered Indiana, Ohio, and part of Michigan, has been transferred to the Chicago territory, with offices at 510 N. Dearborn. Gerald L. Lotz, from the home office, has taken over the territory formerly covered by Mr. Lindahl, with headquarters in Columbus, Ohio.

Omni Products Corp., 460 Fourth Ave., New York 16, N. Y., has announced two brands of plastics materials for foreign distribution.

The first is Extruvin, polyvinyl chloride compounds available in four types of formulations ready for use in extrusion, injection molding, calendering, and wire covering and other electrical applications without the addition of further plasticizer or stabilizer.

The second material is branded Polystron Omni, which is polystyrene molding compound available in a large range of colors.

The new products are produced exclusively for Omni and will be marketed along with the company's other plastics materials, machinery, and equipment for export.

Mineral Pigments Corp., Muirkirk, Md., has opened a sales office at 1261 Broadway, New York, N. Y., with George M. Ferguson in charge. The corporation plans to spend \$1,000,000 in post-war expansion over the next five years, largely on the production of easy grinding, brilliant, and strong iron, chromium and carbon pigments.

Monsanto Chemical Co., has announced various plant and personnel changes as follows:

The Lockport, N. Y., chemical operations will be transferred to the Plastics Div. at Springfield, Mass., in order to take advantage of the proximity of the new formaldehyde plant erected in the latter city. This operation includes manufacture of resins for the plywood industry, comprising urea, melamine, phenol, and resorcinol formaldehyde resins. The Merritt-Monsanto operation will remain in Lockport and will be unaffected by the change.

Carl T. King, production manager of the Lockport chemical operations, will continue in his present position but will have other duties and special assignments; the operation of the Springfield production department will be under the direction of Robert K. Mueller, assistant

production manager.

The production of the continuous and sheet plant in Springfield will be handled by William T. Dickens, assistant plant manager. The phenolic plant there will be under the direction of Kenneth M. Irey, plant manager. John C. Garrels, Jr., formerly plant manager at Lockport, becomes plant manager of the thermoplastic plant. Thomas J. Diviney, director of industrial relations, will be responsible for coordination of office management activities. Carl O. Hoyer will direct operations in divisional engineering and plant engineering.

Robert U. Haslanger has assumed new duties as assistant to the general manager of the Western Div. of Monsanto in Seattle, Wash., and will be succeeded as assistant to the president in St. Louis by James B. Irwin, Jr. I. C. Smith will become general manager of the Western Div. to succeed H. P. Banks, who will retire March 1, 1949.

The Industrial and Surface Coating Resins Sales Dept. in Springfield has been divided into two groups: the Adhesives and Industrial Resins Dept., to be headed by E. Everett Decker, and the Surface Coatings Resins Dept., headed by Albert W. Dunning. The Surface Coatings Resins Dept., will also be responsible for the sale of styrene monomer and formaldehyde.

Kenneth W. Short has been appointed acting purchasing agent for Monsanto's Plastics Div., succeeding Glenn M. Bullard, retired.

Dow Corning Corp., Midland, Mich., has announced a price reduction on its standard viscosity DC 200 and DC 500 Silicone Fluids. Prices now range from \$6.00 per lb. in pint containers to \$5.20 per lb. in 50-gal. drums. The company now has warehouse stocks in Dallas, Atlanta, Los Angeles, and New York.



11

it

NEW "PONY-SIZE"



Only 15 inches wide . . . 20 inches deep . . . 54 inches high—this new, compact G-E 3-kw plastics preheater offers unmatched design features for its size and rating. Here are just a few, well worth your checking—

easy, convenient operation has automatic timers, "pop-up" cover; all meters and controls visible and handy on front of preheater

readily portable—move this new preheater from one press to another in jig time; to install, just plug it into a 230-volt, 60cycle, single-phase outlet

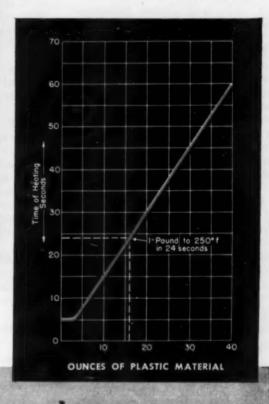
sturdily built for heavy-duty industrial use with durable, highquality components

complete accessibility—all components are "easy to get at" through hinged front door and removable side panels.



3-KW PLASTICS PREHEATER





#### .WITH "WORKHORSE" PERFORMANCE

Designed for round-the-clock, high-production preheating, this new small-size G-E preheater delivers a big 3-kw punch to preform loads—its 40-megacycle operation speeds up preheating, boosts production.

For real performance proof, check the above weighttime curve for preheating wood-flour phenolic compound from 70 to 250 F.

And for complete specifications, send for free bulletin GEA-5091. Apparatus Department, General Electric Company, Schenectady 5, N. Y.

CELASTICS PREHEATERS

GENERAL & ELECTRIC

#### THE PLASTISCOPE

and will pay freight charges on all orders unless faster transportation than normally used is requested.

#### PERSONAL NEWS

S. W. Jones, assistant district manager, Celanese Corporation of America, was elected president of the Worcester-Leominster-Fitchburg Chapter of the Society of the Plastics Industry at the September meeting. Al McIntyre of Reed-Prentice, Inc., was elected secretary-treasurer.

Henry J. Howlett, secretary of the American Management Association, for 13 years, has resigned to become president of Container Laboratories, Inc., packaging and packing engineering consultants with laboratories in New York, Chicago, and San Francisco, and offices in Los Angeles and Milwaukee. He succeeds the late E. A. Throckmorton, Jr.

Dr. Carl F. Prutton, formerly head of the department of chemistry and chemical engineering at Case School of Applied Science, has joined Mathieson Chemical Corp., 60 E. 42nd St., New York, N. Y., as director of research, with headquarters in the company's New York offices and at the research laboratories in Niagara Falls, N. Y.

Charles V. Douglas has been appointed assistant to J. P. Remensnyder, vice-president in charge of sales, Heyden Chemical Corp., 393 Seventh Ave., New York, N. Y. Before joining Heyden, Mr. Douglas was New York district manager for Diamond Alkali.

William Copulsky has joined the staff of R. S. Aries & Associates, consulting engineers and economists, 26 Court St., Brooklyn, N. Y. Mr. Copulsky is the editor of "Industrial Trends" and will be engaged in chemical market research.

Paul N. Clemens has been appointed exclusive agent in the states of Connecticut, Massachusetts, and Rhode Island, for the Lithgow Corp., Chicago, Ill., applicators of resin baking finishes based on Bakelite resins for tanks, pipe, and other equipment. Mr. Clemens has been a district sales manger with the Zapon

Div., Atlas Powder Co., for the past 4 years. He will operate from the new Lithgow plant at Norwalk, Conn.

Edward Kush, formerly of Boonton Molding Co., Boonton, N. J., has joined Arnold Brilhart, Ltd., Mineola, N. Y., as plant manager.

J. W. Ferris has organized his own plastics consulting agency, with offices at 2502 Buena Vista Dr., Ft. Wayne, Ind. He is presently engaged by Bull Dog Electric Products Co., Detroit. Mich.

John J. Freeman has been appointed technical director of The Neville Co., Pittsburgh 25, Pa.

R. F. Boyer has been named director of the Physical Research Laboratory of The Dow Chemical Co., Midland, Mich., and Dr. W. C. Bauman, assistant director. Mr. Boyer has been with Dow since 1935 and for the past three years has acted as assistant to Dr. J. J. Grebe, former laboratory director.

W. B. Hoey has been appointed sales and technical representative for Plastic Research Products Co., Urbana, Ohio.

Anthony D'Agostino, formerly with American Plastics Engineering Corp., and Evans-Winter-Hebb, Inc., both of Detroit, Mich., has joined Detroit Molded Plastic Corp., 6866 Orion Rd., Rochester, Mich., with Detroit offices at 6208 Hamilton Ave.

J. H. Day, editor of The Society of Plastics Engineers "News", and formerly an instructor at Case Institute of Technology, has been appointed assistant professor of physical chemistry at Ohio University in Athens, Ohio.

Carl J. Lamb has been appointed consulting engineer of The Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio.

William F. B. Henderson has been appointed executive vice-president and elected to the board of directors of E. W. Bliss Co., Detroit, Mich.

Charles D. Burton has been appointed manager of the Chemaco Plant of Koppers Co.'s Chemical Div., Berkeley Heights, N. J., succeeding Karl M. Joehnck, resigned.

George B. Makepeace, formerly with the Boston office of The Dow Chemical Co., has joined Cowan-Boyden Corp., Chartley, Mass., as plant superintendent. He has charge of the molding and finishing dept.

#### Deceased

Emil R. Gasser, director of research of Farrel-Birmingham Co., Inc., died Sept. 5 at his home in Buffalo, N. Y.

#### MEETINGS

Nov. 7-10—40th anniversary meeting of the American Institute of Chemical Engineers, Hotel Pennsylvania, New York, N. Y.

Nov. 16—The Society of the Plastics Industry (Canada) Inc., general dinner meeting, Montreal, Que.

Dec. 2-4, inc.—Annual meeting of the Society for Experimental Stress Analysis, Hotel Commodore, New York, N. Y. Inquiries should be addressed to the Society at P. O. Box 168, Cambridge 39, Mass.

Dec. 9—Meeting of the Chemical Market Research Association, at Toronto, Ont., Can. Meetings during the coming year will be held Feb. 10 at New York, N. Y.; April 7 at St. Louis, Mo.; and June 9, annual business meeting, at New York City.

Feb. 15-16—Annual Conference, The Society of the Plastics Industry (Canada) Inc., Niagara Falls, Ont.

Feb. 28-March 4, inc.—1949 Spring Meeting of American Society for Testing Materials, Hotel Edgewater Beach, Chicago, Ill.

#### S.P.E. meetings

Nov. 10—Newark Section, Newark Athletic Club. Dinner meeting 6:30 p.m. Speakers will be C. M. Coe of Shaw Insulator Co., Irvington, N. J., and Eric Gronemeyer of Sameric Engineering Co., Riverdale, N. J. Their subject will be "Responsibility for the Design of Molds" as seen by the user and the designer.

Nov. 17—South Texas Section. 8:00 p.m. Speaker will be Gordon P. Thayer of Dow Chemical Co., Midland, Mich. His probable subject will be "Mold Design."



The handy, accurate machine that every plant NEEDS for speedy production lettering of name plates, small panels, novelties, serial numbers, part numbers, etc.

#### NEW HERMES, INC.

13-19 University Place · New York 3, N.Y.



CRESYLIC ACID
PHTHALIC ANHYDRIDE
TRICRESYL PHOSPHATE

COALTAR CHEMICALS CORPORATION

William D. Neuberg, President

GRAYBAR BLDG., 420 LEXINGTON AVE., NEW YORK 17, N. Y.
TELEPHONE: MURRAY HILL 5-9508
CABLE: "COALTARKEM"



Production speed is strictly a matter of dollars and cents and you can increase your returns, produce more finished plastic film articles per hour, by using a Progressive Electronic Heat Sealer.



#### AUTOMATIC OPERATION FOR GREATER SPEED

Up to 60% faster than other bar sealers, the Progressive is noted for its easy operation. To make novelty items, inflatables, aprons and similar articles, the plastic film or sheeting is merely placed in postion and a button is pressed. While the Progressive closes, seals and opens—all automatically—the operator is free to prepare the next unit for sealing.

Two designs are available—one with a hinged press and one with an overhead, compressed air operated sealing bar, as shown. Generators are obtainable with outputs from .35 KW to 5.0 KW. Special larger units can be supplied up to 10 KW output. Prices range from \$400-\$6500, depending upon generator capacity and machine design. Each Progressive Electronic Heat Sealer comes complete with all necessary gauges and guards.

#### FAST DELIVERY AND SERVICE

Deliveries are prompt and installation is by Progressive Electronic engineers. An efficient field organization services your Progressive Sealer whenever necessary, wherever your plant is located—within 24 hours!

Write now. Arrange for a free demonstration of a high speed, profit-producing Progressive Electronic Heat Sealer. No obligation.





#### PLASTIC MANUFACTURERS INCORPORATED

STAMFORD, CONNECTICUT

Our Purpose

... is to provide plastic services that are fully adequate for your individual needs. Our physical and financial resources have an at PMI important bearing on our ability to fulfill your molded plastic re-

Our facilities are available to present and potential customers, to help solve their problems in regard to design and manufacture of quirements. high-pressure molded parts, and the assembly of components involving the use of plastics and other materials.

PMI provides research development, design engineering, molding and assembly services. Our efforts are directed toward producing plastic products that serve most satisfactorily the end use for

A PMI specialty is the design and construction of complex elecwhich they are designed. trical assemblies, meeting rigid electronic specifications.

The best proof of our capability is the test of service. PMI is at your disposal.

Sincerely yours,
PLASTIC MANUFACTURERS, INC. hyson a. Mes

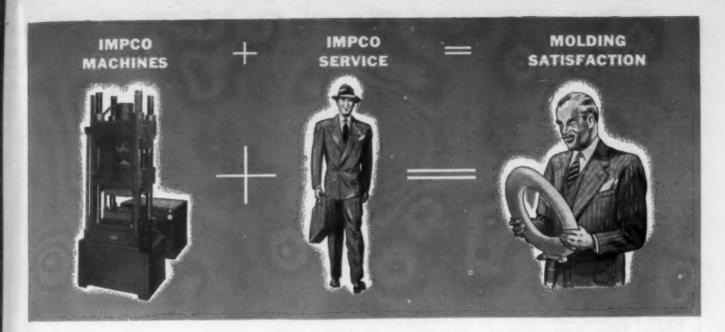
dyryn A. Wick Chairman of the Board

... send for information on our services

PLASTIC MANUFACTURERS

CONNECTICUT

INJECTION .



## What do you buy

#### when you buy a molding machine?

mpco machines are engineered to start right, operate right, and require little attention. However there are services and courtesies involved in getting the machine installed, instructing operators and helping you realize the full benefit from your equipment.

It's Impoo policy: to furnish you with the most modern machines and to render willingly and cheerfully the services that are necessary.

We want you to be a satisfied customer. Write us about your plastic-molding problem . . . injection-compression, transfer, compression or straight injection.

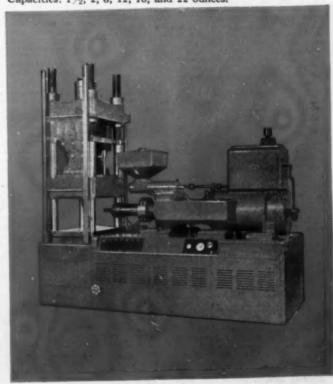
ampco M-11

**MOLDING MACHINES** 

PLASTIC MOLDING MACHINERY DIVISION Improved Paper Machinery Corporation NASHUA, NEW HAMPSHIRE

#### Below is the Impco Type VF machine. It may be used for:

- (1) Straight injection molding of thermoplastic materials
- (2) Injection-compression molding of thermoplastic materials
- (3) Compression molding of thermosetting materials
- (4) Plunger or transfer molding of thermosetting materials Capacities: 1½, 2, 8, 12, 16, and 22 ounces.



WANTED: PLASTIC Scrap or Rejects in any form. Cellulose Acetate, Butyrate, Poly-styrens, Acrylic, Vinyl Resin, etc. Also wanted surplus lots of phenolic and urea molding materials. Custom grinding and magnetizing. Reply Box 318, Modern Plastics.

HYDRAULIC PRESSES BUILT to specifica-tions for Plastic Items. Record Presses, pro-ducing two per min. We have in the used equipment (1) 1000 ton 30 x 30, 20" ram, 14" stroke, 34" day-light \$1800. (1) 600 ton 40 x 48, 18" ram, 36" stroke, 12' day-light \$2200. (1) 300 ton 23 x 48, 18" ram, 24" stroke, 81800. (1) 400 ton 22 x 30, 16" ram, 18" stroke, day-light 36" \$1500. (2) 200 ton, 43 x 48, 13" ram, 36" stroke, 48" day-light \$1200 each (3) 30 ton, 11-½ x 11-½, 10" ram, 10" stroke, 3 post downward acting self-contained \$1000.00 each. Sal's Press, 386-390 Warren Street, Brooklyn 2, New York. MAin 4-7847.

FOR SALE Hydro Pneumatic Accumulator, 13 Gal. 3500\(\pi\). Ball \(\preceq\) Jewell Rotary Cutter. Model R and "T" Stokes Tablet Machines. 50 Ton Press with 18" x 18" Electric Plates. 190 ton 20" x 20" press. Racine Pumps. Boosters, Valves, Logan Pumps. Valves. Self-Contained—200 H.P. 290 Gal. 3000\(\preceq\) Pump 18" x 15". Accumulator 1500\(\preceq\) Pump 18" x 15". Accumulator 1500\(\preceq\)—15" x 11" Acc. 400-2000". 6" x 9" Accumulator-2000\(\preceq\), 300 Ton Press 20" Ram, 8" Stroke, 24" x 20" Platen. 500 Ton—1000 Ton Hobbing Press—Hele Shaw Variable Pressure 33 GPM 2500\(\preceq\)—Vickers Oil Pumps 17 GPM 500 to 1000\(\preceq\). Etilman 13" x 13" Laboratory Presses. Aaron Machinery Co., 45 Crosby 8t, NYC.

FOR SALE: Thropp 16" x 36" 2 Roll Rubber Mill; Royle #2 Perfected Extruder; 590 ton Hydr. Molding Press 42" x 48"; Field 300 ton 23" x 30"; Francis 200 tons; 24" x 18". Albert 100 Ton, 2 opening, 24" x 18". Albert 100 Ton, 2 opening, 24" x 24". Also presses 20 to 250 tons from 12" x 13" to 36" x 36" & 40 ton Broaching Press. Watson-Stillman Hor. 4 plgr. 1"x2" x 4" H. & L. Pressure Pumps; HPM 1%" x 6"; vertical triplex 10 GPM 2700 lbs.; 7 Hydr. Oil Pumps, Vickers, Oilgear, Northern, etc., Elmes 1" x 4" & 1¾" x 4" hor. 4 plgr. 5 to 8 GPM 4500 lbs. \$5500 lbs., Elmes 2" x 6" hor. 30 GPM, 2500 PSI; Rumsey 4½" x 8" vert. Triplex 65 GPM 900 lbs.; Elmes 2" x 6" hor. 30 GPM, 2500 PSI; Rumsey 4½" x 4" hor. 17 GPM 350 lbs.; Hydr. Steam Pumps; Low Pressure Pumps 150 to 600 lbs. Hydr. Accum.; Stokes type 200 Automatic Molding Fress. Stokes the tryperform Tablet Machines 1-3/10", 1½" and 65, also single punch; Injection Molding Machines 2 oz. to 12 oz.; Baker Perkins Jacketed Mixers 200, 100, 50, 20, b & 0.7 gals. capacity; New and used Rotary Outers; Rubber Mills; Calenders, Banbury Mixers, etc.; Heavy duty Mixers; Grinders; Fulverisers; Gan Bollers, etc., PARTIAL LISTING, WE BUY YOUR USED MACHINERY, STEIN EQUIPMENT CO., 90 WEST ST., N. Y. 6, N. Y. WOrth 2-5745.

THERMOPLASTIC SCRAP wanted, Poly-styrene, Cellulose Acetate or Yinyl. Scrap or rejects in any form, Surplus lots purchased. Highest Prices. Box C787, Modern Plastics.

FOR SALE — because of process change — Two Westinghouse Indus-trial Type Radio Frequency Genera-tors, 20 KW, 450 Kilocycles, 460 Volts, 3 Phase, 60 Cycles, In good working condition — used only six months. Reply Box C726, Modern

FOR SALE—1—Watson Stillman Hydro-Pneumatic High and Low Pressure System. complete, 3000½; 12—Baker Perkins 100 gallon Plastic Mixers; 1—12" x 12" Press 7" Ram, Steel Hented Platens and Hand Pump attached; 2—24" x 24" Adamson, 10" ram, 2—opening Hydraulic Press; 2—La Pointe Hydraulic Pumps, 150 G.P.M.—2000 lb. pressure direct motor driven to 125 HP AC motors; 1—French Oil Hydropneumatic Accumulator; 1—14" x 24" Press, 9" ram; 2—Royale #3 Perfected Tubers; 1—Royale #3\* Perfected Tubers; 1—Royale #3\* Perfected Tubers; 1—Cavagnaro 2 cylinder 10" diameter Vertical Hydraulic Extruder; 1—Devine #11 Vacuum Shelf Dryer, 17 shelves heated 40" x 42"; 1—Farreil 6" x 12" 2-roll Rubber Mill; 1—48" x 48" 3—opening Hydraulic Press, 4—10" diameter rams, 300 tons; Dry Powder Mixers; Pulverizers; Grinders; etc. Send for complete list. Box CS81, Modern Plastics.

LINES WANTED Sales Representative, New York, specializing in 5¢ to \$1.00 items for big Chain Stores and Jobbers, desires to contact manufacturers or molders of Plastic Specialties, Housewares, Toys, Notions, Stationery or Novelties. Backed by 20 years' experience and an extensive following. I can assure you of volume distribution. Commission basis. Reply Box C724, Modern Plastics. Plastics.

WANTED: MOLDS (all items) and Machines: Injection, Transfer, Extruding. Can act quickly and pay cash if you describe fully naming: Maker, Serial Number, Age, Condition, Capacity, Where seen, Lowest Price, and also Wt. of molded part or picture of piece from molds. Are samples available? Beply Box C733, Modern Plastics.

INDUSTRIAL DESIGNER—Stylist with creative ability, experienced in production and product development in compression and injection molding, sheet forming and casting resins, desires connection with molder, fabricator or progressive manufacturer of products in which plastics play an important part, Free lance or part time basis. Chicago area preferred. Reply Box C744, Modern Plastics.

#### CHEMIST AVAILABLE COATINGS—LAMINATIONS— IMPREGNATIONS—ADHESIVES

Consulting Technical Director of leading company for the past seven years will be available shortly due to reorganization. Textiles, papers and metals. Rubbers, resins, lacquers and colors. Production or Development.

Metropolitan New York only, eply Box C736, Modern Plastics

FOR SALE Dies and patents of two nationally distributed, plastic, electrical products owned, controlled, manufactured and marketed by ourselves, Current inventory 37,500. Now engaged in unrelated industry, Both are volume products sold by leading stores and Jobbers throughout country. Nationally advertised, sold by sales agents in protected territories. Would be willing to dispose of accounts receivables. Principals only with \$20,000 PLUS. Negotiations confidential. Box C755, Modern Plastics.

#### PEGS \* SAWDUST COMPOUND — MIXTURES

Kew Bee Kut compound mixtures now being produced. It has more cutting qualities than the ordinary

grades. Square Kut Pegs \*\*\* Italian Pumice, fine and lump grades. Write for par-ticulars. National Sawdust Co., Inc. 82 N. 6th St. Brooklyn 11, N. Y.

WANTED: Used Moulds of any kind for manufacturing abroad. Lucien Stern, 385 Fifth Ave., New York 16, N. Y.

YALE GRADUATE: Top creative product design record, metal and plastic fields—plus executive sales promotion and merchandising experience, desires position as director of design or products development manager. Reply Box C752 Modern Plastics.

POSITION WANTED—Sales Representative with considerable Sales experience in Plastics Field desires connection with Manufacturer contacting Industrial accounts. Territory, New York State or Detroit Area. Prefer something with headquarters in New York State. Reply Box C764, Modern Plastics.

#### WE PAY CASH-

for distressed or surplus lots of Plexi-glas and Lucite sheets, rods. and tubes. Any sizes (trim grade), thick-nesses, colors, or quantities accepta-ble. Write Box C763, Modern Plastics

FOR SALE Model D-1/2 Illitron High Frequency Heat Scaler and Press. New November 1947. Like new, used very little. No reasonable offer refused. Reply Box C753, Modern Plastics.

WANTED TOYS AND HOUSEWARES LINE WANTED TOYS AND HOUSEWARES LINE by well rated experienced sales representa-tive, New York office and showroom, with excellent following among syndicate chains, jobbers and exporters. Manufacturer must have good organization and volume facili-ties. Commission basis. Present nationally known items carried will not conflict with plastics line. Reply Box C754, Modern Plastics.

SIDELINE FOR LIVE WIRE
Novelty Salesman—
Shopping Bags—Utility Bags—Electronic Sealed Premium Items—High
Commission and Bonus.
STERLING NOVELTY PRODUCTS
Division of Glovemakers, Inc.
2701 No. Milwaukee Ave.
Chicago 47, Ill.

IF YOU HAVE GOOD HYDRAULIC PRESSES with modern pumping equipment for sale send me your specifications of same with photo, and I will see to it that you will get the best price available. Sal's Press, 386-390 Warren Street, Brooklyn 2, N. W. MAIN 4-7847. Press, 386-390 Wil. N. Y., MAin 4-7847.

FULLY QUALIFIED urea plastic button color technician, versed in both solid and mottle color control; thoroughly familiar with all phases of urea plastic button manufacture. Reply Box C756, Modern Plastics.

1947 MULTIPLE PLATEN PRESS-ten openings, Erie Engine manufac-ture, 27" x 36" one piece frame con-struction, fully automatic, complete with pumps and all controls for heat-ing and cooling cycle. Used slightly.

1947 KEWANEE HT high pressure boller—all welded ASME 125# pres-sure, 50 horsepower, complete with all attachments.

ALSO, 2 Wisconsin Oil Burners, electric eye control, each burner rated 15 gals, per hour to fit the Kewance boller. Press, boller, burner can be bought separately. Reply Box C758, Modern Plastics.

SALES REPRESENTATIVE. Have excellent SALES REPRESENTATIVE. Have excellent contacts with Chicago area industries. A good knowledge of plastics and an engineering and cost background. Can give complete coverage of this area. Prefer to confine any custom molding representation to midwest manufacturers. If you can use a stable, hard-hitting man full time or as representative, Reply Box C759, Modern Plastics.

(Continued on page 206)

# ONLY RECESSED HEAD SCREWS

### REWS ANTITIES PHILLIPS MANUFACTURERS turers adopting andard in their HAVE FACILITIES FOR ing daily. Nat-PRODUCING MANY MILLIONS OF PHILLIPS SCREWS PER 8-HOUR DAY mber, unlimited production potential is one ok in choosing a cross recessed head screw. With Phillips Screws, you can depend on it.

# from MULTIPLE sources of supply

With the cross recessed head screw rapidly becoming the preferred screw for all types of industrial assemblies, it is all-important to be sure that present and future needs can be supplied.

Since Phillips is the only cross recessed head screw with multiple sources of supply, Phillips Screws are your logical choice. And this is just one of the five important reasons why only Phillips Screws give you all the advantages of the cross recess design.

#### Get this new Fact-Full Booklet

that lets you in on the important facts you can't afford to overlook when you choose cross recessed head screws. It's FREE. Use the coupon.

GET ALL THE ADVANTAGES OF ASSEMBLY WITH CROSS RECESSED HEAD SCREWS...

### PHILLIPS Recessed SCREWS

Wood Screws . Machine Screws . Self-tapping Screws . Stove Bolts

American Screw Co.
Camear Products Co.
Central Screw Co.
Continental Screw Co.
Cerbin Screw Div. of
American Howe. Corp.
The H. M. Harper Co.
Lamson & Sessions Co.
Millood Rivet and Machine C.
Millood Rivet and Machine C.

750URGES

National Seriew & Mfg. Co New England Seriew Co. Parker-Kalon Corporation Pawturket Seriew Co. Pheold Manufacturing Co. Reading Seriew Co. Rockfood Survey Products C. Russell Burdsall & Ward
Bolt & Nut Co.
Scovill Manufacturing Co.
Seaboard Strew Corp.
Shakeproof inc.
The Southington Hardware Mfg. Co
The Steel Company of Canada, Ltd
Sterling Bolt Co.
Stronghold Screw Products, Inc.
Wales-Beech Corp.
Wales-Beech Corp.



Phillips Screw Mfrs., c/e Horton-Neyes Co. 1800 Industrial Trust Bidg. Providence, R. I.

Address

Send me the new booklet - "How to Select Recessed Head Screws for Practical Production Driving".

Name \_\_\_\_\_

MP-35

(Continued from page 204)
PATENT—Which firm of Injection Molder is interested in a Patent Plastic Closet Seat?
For further information write to S. Wolfling.
Ltd., 50 & 60 Myddelton Street, London.
E. C.1, England.

WANTED LIST and offers of latest patents for all plastics articles easily sold in South America. Reply Box #C762, Modern Plastics.

#### WRITE YOUR OWN PAY CHECK!

Leading Australian plastics manufacturers require a top technical executive thoroughly competent to initiate and pilot production in all phases of plastics.

A substantial basic salary is offered plus a percentage on production figures by which the salary to be earned will be governed only by the energy and effort displayed by the recipient.

Selected applicant will be flown to Australia for interview before final appointment.

Replies: Box No. C761, Modern

#### PLASTICS SALESMAN

Experienced Salesman for N. Y. C. Plastics Extrusion firm, long established with top reputation. Must have technical background and sales con tacts, for Rods, Tubing and special shapes in all Thermoplastic materials. Give complete qualifications, references, etc. for interview. Reply Box C766, Modern Plastics.

WANTED: Sink strainer injection mold. Must be in operating condition. Reply Box C767, Modern Plastics.

FOR SALE—Two 2 oz. HPM 3 tie bar hydraulic injection presses and two 4 oz. Reed Prentice hydraulic presses. Attractive price.—Superior Plastics Division 426 N. Oakley Bivd., Chicago 12, III.

FOR SALE INJECTION PRESS New Van Dorn Injection press Model H-200 Never Used You can save \$200.—on this unit. In-dustrial Technical Schools, 41 Phillips St., Boston, Mass.

#### PLASTICS DEVELOPMENT ENGINEER

Large plastic and metal plant seeking man with experience to develop items for chain stores. Flyed salary with percentage of profits. No capital needed . . . Just ideas and ability. Replies confidential. Box 797, Realservice, 110 W. 34th, N. Y. C.

AVAILABLE—PLASTICS SPECIALIST, 35, B.S. in Chem. 8 yrs, diversified experience in plastics field including research, processing, product designing and testing low pressure and contact laminates for aircraft and civilian use. Presently employed in midwest. Seeks new position with progressive organizaton. Box C769, Modern Plastics.

MOLD FOR SALE, for fancy buttons, eight cavities, injection type. Reply to Box C765, Modern Plastics.

WATSON-STILLMAN one ounce injection molding machine. Also several cwt. poly-ethylene. Best offer. H. J. Feltus, R.D #2, Seneca Falls, N. Y.

FOR SALE 2 Thropp two-roll mills 16" x 30"; 8 Rotary 16-punch preform presses; 6 jacketed double arm H.D. mixers 50/150 gal, Grinders, filters, kettles, pumps, tanks. PERRY EQUIPMENT CORP., 1520 W. Thompson St., Phila. 21, Pa.

WILL BUY outright or part interest medium-sized plastic established. molding plant, injection-type machines; prefer one or more Watson Stillman 16 oz. machines. Reply Box No. C768, Modern Plastics.

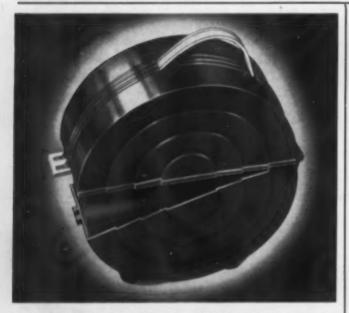
PLASTICS TECHNOLOGIST—37, Ph.D in organic chemistry, 12 years of broad industrial experience in development of thermosetting and thermoplastic materials. Last two years management of pilot plant. Patents and publications. Best references. Desires administrative position with well established concern. Box C770, Modern Plastics.

MACHINERY FOR SALE. 5 Cummings quick acting hydraulic presses suitable for drawing sheet plastics and low pressure laminates, 1-10 H.P. Ingersoil Rand Compressor. 1 Ball & Jewell #1 Plastics Grinder. All equipment in perfect condition, can be seen in operation at CREATIVE MOULDED PRODUCTS CO. 434-6th Ave., N.Y. 11, N.Y.

#### CHEMIST WANTED

Experienced in the manufacture of phenolic molding compounds. Must be quantified to direct processing and develop use of specific compounds. Midwestern location. Reply Box C772, Modern Plastics,

WISH TO CONTACT Plastic mold maker qualified and equipped to make sun glass molds. Reply Box #C771, Modern Plastics.



#### ATTRACTIVE RECORD CARRYING CASE MOLDED OF TENITE II . . . HOLDS 25 RECORDS

Nationally advertised and distributed. Made in 6 beautiful colors. Designed, molded, and fabricated by Ant usen. Take advantage of our unexcelled designing and engineering facilities.



#### ANFINSEN PLASTIC MOLDING

NEW YORK STREET AURORA, ILLINOIS

#### FURANE PLASTICS

& CHEMICALS COMPANY 719 West Broadway, Glendale 4, Calif.

Manufacturers of

"PLASPREG"\* RESIN-For impregnating and hardening plaster of Paris castings, patterns, and tooling.

FURANE RESIN X-2 ADHESIVE-Outstanding adhesive for phenolic, urea, melamine, polyester, and acrylic plastics.

"JET-KOTE" SURFACE COATING-Hard, black, chemical resistant, room temperature setting resinous coating.

"CALCERITE" CASTING COMPOSI-TIONS-Ready-mixed powdered compositions which will cure at room temperature to hard, durable castings, tooling, forming dies, duplicating dies for tool room, metal embossing, etc.

\*Reg. U.S. Patent Office

# COMING SOON.

#### A NEW STUDY OF **\$5 BILLION PACKAGING MARKET**

to help you plan your selling and advertising



The Department of Commerce in June, 1947, rated the design, testing, production, shipping and merchandising of packages as a five billion dollar business. Considered as a separate industry, packaging rates as one of the largest in the country - larger than steel and machinery, larger than the automobile industry at its 1939 level. And its volume is increasing as more products find their way into packages and more labor-saving packaging machinery goes on the production line.

#### AN ACTIVE, FLUID MARKET

Faced with increasing competition and shrinking profit margins, manufacturers are closely scrutinizing packaging materials, methods and equipment. They are eagerly searching for ways to cut production, distribution and sales costs, and improve the style, sales appeal, product protection, brand identification and take-home-value of their packages.

Always a fluid market, the packaging industry is in a ferment of change as products move from one type of container to another. Packaging's basic forms—the metal can, glass jar, paper wrap and boxboard carton - have all been improved. New materials, and some old ones that were never used in packaging before, have made inroads in the market-materials like aluminum, plastic films and fibers to name but a few. And these changes in material often mean a change in equipment all along the

#### ADDITIONAL MARKET DATA COMING

Modern Packaging presents this study as the first part of a complete and continuing analysis of this lucrative and growing market. Future data sheets and studies will contain current statistics and further information on how the industry buys, what it buys, and how it is organized—all designed to help you evaluate your product in terms of this market and to help you plan your advertising and selling to it. You'll find these sheets easy to file in the handy file folder the first study comes in.

#### "MUST" READING FOR SALES-MINDED EXECUTIVES

Get your name on the mailing list for this complete analysis by reserving your copy of the study now. Just tear out and send us the attached coupon.



#### 32 PAGES OF ILLUSTRA-TIONS, CHARTS AND TEXT CONTAIN CHAPTERS ON:

Size of Packaging Market Industries That Comprise the

What the Packaging Field

Materials and Supplies

Machinery and Equipment

Why Packaging Is a Horizontal

Growth of the Packaging Field

RESERVE YOUR FREE COPY NOW

Modern Packaging 122 East 42nd Street, New York 17, N. Y.

> Please send me, without obligation, my free copy of "The Packaging Market and How to Reach it."

Company Products

MAGAZINE



Yes... FLEXIBILITY is the real secret of every mpm extrusion machine . . . BUILT FOR WORK!!

LESS SCRAP PER POUND:—thru multiple electrically heated zones which give greater heat control.

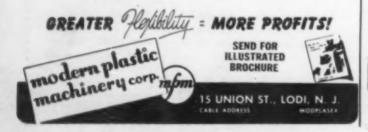
MORE FREE MACHINE TIME:—thru 9-11-15 individually controlled cooling zones which cools the cylinder in a matter of minutes.

GREATER PRODUCTION:—Corrosion resistant surface gives more uniform clean material. Will average DOUBLE PRODUCTION on methylmethacrylate in some cases.

MORE VARIED MATERIALS:—can be used in an mpm extruder because only mpm extruders are electrically heated to make possible the extrusion of new-high temperature compounds.



Mpm EXTRUDERS are furnished with dies and all accessories needed for the production of covered wire, flat sheet, rods, strips, tubes and the 1000 and 1 items demanded by a prosperous and growing industry.



# the Cole Pyrometer

- Replaceable tip and couple
- Flexible thermocouple shaft
- Big easy-to-read scale



It's simple to determine the exact temperature of any part of a mold die, press, cylinder or extruder when you use the Cole Pyrometer. The flexible "gooseneck" shaft bends into suitable shapes, enabling the thermocouple mounted in its tip to reach the most inaccessible places with ease. Made in

A

B

Ba

Ag

B

B:

Be

Be

Be

Br

Ago

Ca

Ca

one piece, without trailing wires, the Cole Pyrometer can be held in one hand, permitting the operator to make necessary adjustments while taking readings.

The meter used in the Cole is built by us specifically for pyrometer use. It's accurate, rugged enough to withstand normal industrial hazards, and has an extremely long scale with large graduations. Either Fahrenheit or Centigrade calibrations are available, in 8 scale ranges from 0°-300°F. to 0°-1200°F. The thermocouple and tip can be replaced without delay in your own plant—no recalibration necessary.

#### TWO MODELS

Model 107 has a protected thermocouple for gauging surfaces that are in motion such as rollers and platens or that are rough, abrasive or adhesive. It gives accurate readings after only a few seconds contact. Model 108 is provided with an unprotected thermocouple tip for use on smooth, stationary surfaces and reads instantaneously.

#### COLD END COMPENSATION

All models are furnished with automatic cold and compensation in the lower ranges and manual compensation in the higher ranges. Automatic compensation can be supplied in the higher ranges at a slight additional cost.

Despite their quality construction and outstanding design, Cole Pyrometers are amazingly low in cost. Write immediately for prices and full particulars.

#### -COLE INSTRUMENT CO.

1320 SOUTH GRAND AVE.

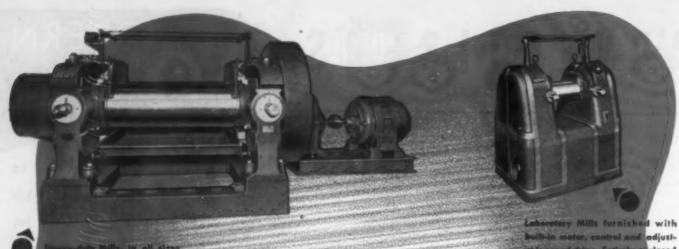
LOS ANGELES, CALIF.

## ADVERTISERS

MODERN PLASTICS

NOVEMBER, 1948

Able Mfg. & Finishing Co	166	Carver, Fred S. Inc	68	Elmes Enginering Works of Amer. Steel Foundries	65
Agency—Harold Marshall Adv. Compa	175	Catalin Corporation of America Agency—Walter J. Gallagher Adv.	1	Agency—ERWIN, WASEY & Co., LTD.  Engis Equipment Company	178
Adamson United Company 4. Agency—Smith, Taylor & Jenkins, Inc.		Cavagnaro, John J	181	Agency—Central Advertising Service Enterprise School of Plastics	197
Aldrich Pump Co., The	23	Celanese Corporation of America Agency—Ellington & Co., Inc.	9	Erie Engine & Mfg. Co	210
Allied Products Corporation . 137. Agency—Charles M. Gray & Assoc.	, 197	Central Screw Company	205	Agency—The Yount Company Erie Resistor Corporation	53
Allis Chalmers Mfg. Co Agency—Compton Adv., Inc.	187	Chicago Molded Products Corp.  Agency—Almon Brooks Wilder, Inc.	4	Agency-W. S. HILL COMPANY	
American Cyanamid Co., Plas- tics Div	117	Co., The	186	Fabricon Products, Inc., Plastics Div	163
Agency—Hazard Advertising Company American Insulator Corporation	74	Claremont Waste Mfg. Co Agency-Walter J. Gallagher Adv.	120	Farley & Loetscher Mfg. Co  Agency—Weston-Barnett, Inc.	189
Agency—Kamp & Godfrey, Inc.  American Molding Powder &		Classified204,	206	Farrel-Birmingham Co., Inc. 138, Agency-Gassaway, Mark & Co.	139
Chem. Corp	151	Coaltar Chemicals Corp	201	Federal Tool Corporation	156
American Pulverizer Company.	184	Cole Instrument Company	208	Fellows Gear Shaper Co., The	133
Agency-Eggers-Rankin Adv. Service		Columbus Molded Plastics Corp.  Agency—George Prout	144	Agency—Hicks & Greist, Inc. Felstenthal, G., & Sons, Inc	153
American Screw Co	205 170	Conforming Matrix Corp Agency—Wendt Adv. Agency	181	Agency-Central Advertising Service	
Agency-Cummings, Brand & McPherso	N	Consolidated Molded Products		Ferro Enamel Corporation Agency—Fuller & Smith & Ross, Inc.	142
Anfinsen Plastic Molding Corp.  Agency—Harry F. Port Adv.	206	Agency—Walter J. Gallagher Adv.	37	Fortney Mfg. Co., Inc	176
Atkins, E. C. & Co	171	Continental Can Company Agency—Batten, Barton, Durstine & Osborn, Inc.	33	French Oil Mill Machinery Co., The	182
Atlas Valve Company	168	Continental Screw Co	205	Furane Plastics & Chemicals Co.	206
Babco, Inc	162	Corbin Screw Div. of American Hdwe, Corp	205	G. M. C. Process Corp	185
Bakelite Corporation Inside Back	Corre	Cruver Mfg. Company	46	General American Transporta- tion Corp.	49
Agency-J. M. Mathes, Inc.	Lover	Cumberland Engineering Co.,	179	Agency-Weiss & Geller	
Bamberger, A., Corp	151	Agency—Richard Thorndike Precision Adv.	119	General Electric Company, Apparatus Dept	199
Barker & Davis Co., Inc	193	DeMattia Machine & Tool Co	25	General Electric Company. Back Congency—Benton & Bowles, Inc.	over
Behr-Manning	51	Agency—George Homer Martin  Diemolding Corporation	184	General Electric Company, Phen- olic Materials Div	69
Boonton Molding Co., The  Agency—The Franklin Fader Co.	16	Dings Magnetic Separator Co  Agency—Russell T. Gray, Inc.	158	General Industries Co., The 118, Agency—Meldrum and Fewsmith, Inc.	119
Borden Co., The, Chemical Div. Agency—Lawrence I. Everling, Inc.	48	Distillation Products, Inc Agency—The Griswold-Eshleman Co.	59	Gering Products, Inc	47
Bridgeport Moulded Products, Inc	41	Dow Chemical Co., The Agency—MacManus, John & Adams, Inc.	195	Goodrich, B. F., Chemical Co Agency—The Griswold-Eshleman Co.	3
Buttondex Corporation	142	Drakenfeld, B. F., & Co., Inc Agency—Fuller & Smith & Ross, Inc.	188	Goodyear Tire & Rubber Co.,	31
Agency-Lancaster Advertising		Dunning & Boschert Press Co.,	156	Agency-N. W. Ayer & Son, Inc.	31
Cambridge Instrument Co., Inc. Agency—E. M. FREYSTADT ASSOC., INC.	182	DuPont de Nemours, E. I. & Co.,	7	Agency-Jones Frankel Company	136
Camear Products Company	205	(Inc.), Plastics Dept  Agency—Batten, Barton, Durstine & Osborn, Inc.	•	Hannifin Corporation	185
Carborundum Company, The Agency—Comstock, Durres & Co.	149	Durez Plastics & Chemicals, Inc.		Agency-Armstrong Advertising Agency	
Carpenter Steel Co., The	163	Agency—Comstock, Duffes & Co.	over	Hardesty Chemical Co., Inc Agency—Terrill Belknap Marsh Assoc.	167
Agency-Beaumont, Heller & Sperling, Inc.		Eleo Tool & Screw Corp	205	(Please turn to page 2	211)



livery-duty Mills, in all cises up to 84 inches, festuring extra heavy construction, speech Laboratory Mills furnished with hulli-in motor, control and adjustable speed drive. Entirely exclosed ready to operate. Mechanism is readily accessible.

# QUICK PROFITS with EEMCO'S QUICKER DELIVERY

42-ton Leborotory Pressos, an tirely self-contained, equipped with 12"x12" platens, occupying floo space at only 14"x 26". Has adjustable opening.

Preserve for compression, transfer molding, laminating, and poliching. All sizes and types. Custom built.

TO INCREASE PRODUCTION — and therefore profits — you should choose EEMCO. Here is a line made in a factory with more than 30 years experience in Rubber and Plastic machinery. EEMCO operates its own modern foundry and machine shop, and has every facility including a large stock of motors, controls, and necessary component parts to insure quick delivery. Choose EEMCO for correct design and sturdy dependability. Built for heavy duty and long life, EEMCO saves time and money. Currently, EEMCO is making exceptionally fast deliveries. Write today for quotations.



PRESSES

CRACKERS

CALENDERS

EEMCO ERIE ENGINE & MFG. Co.

953 EAST 12th ST., ERIE, PENNA.

RUBBER AND PLASTICS - MACHINERY DIVISION

(Continued from page 209)		Manco Products Company	164	New England Screw Company	205
Harper, H. M., Co., The	205	Marblette Corporation, The	161	New Hermes, Inc	201
Hassall, John, Inc	178	Agency-Perlowin Studios	40	New Jersey Zinc Co., The	12
Hauser Products, Inc	163	Martin, Glenn L., Co., The Agency-Vansant, Dugdale & Co., Inc.	40	Nixon Nitration Works	19
Hercules Powder Company Agency—Fuller & Smith & Ross, Inc.	132	Martindell Molding Company Agency-Eldridge Northbop, Inc.	167	Agency—Alfred A. Morse & Company Northern Industrial Chemical	
Heribert, Inc.	17	Mayflower Electronic Devices,	154	Agency—The Callaway Associates	179
Hydraulic Press Mfg. Co., The Agency—The JAY H. MAISH COMPANY	13	Maywald, Elmer C., & Co., Inc.	154	Norton Laboratories, Inc	62
Agency-The JAY II. MAISH COMPANY		Agency-Robert A. Gallagher, Adv.	100	. Agency-Comstock, Duffes & Co.	
Improved Paper Machinery		Mearl Corporation, The	180	Owens-Corning Fiberglas Corp.	64
Agency—The Davis Press, Inc.	203	Mears-Kane-Ofeldt, Inc	164	Agency-Fuller & Smith & Ross, Inc.	
Industrial Synthetics Corp Agency—RAY-HIRSCH Co., INC.	141	Metasap Chemical Company Agency—Charles Dallas Reach Co.	36	Owens-Illinois Glass Company.  Agency—J. Walter Thompson Co.	129
Interlake Chemical Corporation Agency—The Bayless-Kerr Company	29	Midland Die & Engraving Co Agency—Behel & Waldie & Briggs, Inc	104	Packless Metal Products Corp.	213
Inter-State Products Company	189	Milford Rivet & Machine Co	205	Agency-Richard LaFond Advertising. Inc.	
Johnson Corporation, The	186	Miller, Frank & Sons  Agency—Almon Brooks Wilder, Inc.	166	Parker-Kalon Corporation 38, Agency—Horton Noves Company	205
Agency-Kreicker & Meloan, Inc.	100	Mills, Elmer E., Corporation Agency—Bozell & Jacobs, Inc.	57	Pawtucket Screw Company	205
		Minnesota Plastics Corporation	28	Pheoll Mfg. Company	205
Inc. Agency—Doe-Anderson Adv. Agency	147	Agency—Wilson Advertising Agency Modern Packaging Corp	207	Phillips Screw Mfrs	205
Keyes Fibre Company	165	Modern Plastic Machinery Corp. Agency—London Advertising Agency	208	Pittsburgh Plate Glass Co., Paint Div.	197
Kingsley Stamping Machine Co.	175	Modern Plastics Encyclopedia	159	Plaskon Div., Libbey-Owens-Ford	
Agency-Stuart Stevens Adv.  Kirk, F. J., Molding Co	150	Molded Products Corporation  Agency—Cruttenden & Eger	58	Glass Co	111
Agency-Arnold & Co., Inc.		Monsanto Chemical Company,		Plastex Machine Corp	155
Agency—Batten, Barton, Durstine & Osborn, Inc.	6, 67	Plastics Div	, 55	Plastic Manufacturers, Inc Agency—J. C. Bull, Inc.	202
Kuhn & Jacob Molding & Tool		Monsanto Chemical Company, Organic Div	63	Plastic Mold Tool & Die Co	150
Agency-Eldridge-Northrop, Inc.	171	Agency-GARDNER ADVERTISING COMPANY		Plastics Industries Technical Institute	10
Kurz-Kasch, Inc	24	Mosinee Paper Mills Company  Agency—Klau-Van Pietersom-Dunlap Assoc.	18	Agency-Larry Pendleton & Associates	70
Inc.		Moslo Machinery Company	188	Plax Corporation	73
	007	Agency-Stedfeld & Byrne, Inc.	145	Process Mold Company	154
Lamson & Sessions Co	205	Muchistein, H., & Co., Inc Agency—Goold and Tierney, Inc.	147	Progressive Electronics Co., Inc.	201
Lane, J. H., & Co., Inc.	144	Myler Plastics Corp	145	Prophylactic Brush Company	20
LaRose, W. T., & Assoc  Agency—Theodore H. Sorenson	212	Agency-Rose-Martin, Inc.		Agency-Lambert & Peasler, INC.	
Lee Products, Inc	159	National Automatic Tool Co.,	143	Railway Express, Inc	145
Lester-Phoenix, Inc	34	Agency-Emerson E. Mook, Inc.	145	Agency-The Caples Co.	
Lucidol Div., Novadel-Agene		National Eric Corp	50	Reading Screw Company	205
Corp	193	National Lock Company	205	Recto Molded Products Inc Agency—Creative Advertising	136
Lupo Research Laboratories	213	National Rubber Machinery Co. Agency—The Griswold-Eshleman Co.	27	Reed-Prentice Corporation	8
Mana & Waldata's Common	101	National Screw & Mfg. Co	205	Reichhold Chemicals, Inc	135
Maas & Waldstein Company  Agency—Dovle, Kitchen & McCormick, Inc.	191	Newark Die Co., Inc	193	(Please turn to page	

MODERN PLASTICS



A BRESKIN PUBLICATION

PUBLISHED BY MODERN PLASTICS, INC. - 122 EAST 42nd STREET, NEW YORK 17, N.Y.



AMERICAN PHENOLIC CORP., Chicago, Illinois
A leading molder of electrical parts. . . .
Here's what . . .

#### AMPHENOL SAYS:

"Set up on Amphenol 60 ton transfer molding presses, THERMALL High Frequency Preheaters are performing an excellent job. They are light, easy to move around and for that reason they are well liked by the molding room personnel. Breakdown time is negligible."

Leading molders and pioneers in plastics consider THERMALL headquarters for their preheating equipment. This reliability is a result of THERMALL's simplicity, ease of operation, and continuous performance—products of thorough and progressive engineering design.

New York

Depth

Height . . . . 22" Width . . . 12"

GENERAL PURPOSE

PREHEATER

It will pay you to look into the many THERMALL advantages that enable you to produce superior plastic moldings. For information on the advantages, and uses or for demonstration anywhere in the world, write

Boston Trenton Detroit

Chicago

W. T. LAROSE & ASSOCIATES, INC. TROY, NEW YORK, U.S.A.

GUARANTEED PERFORMANCE ... or it doesn't cost you a cent!

St. Louis

Denver Seattle

Seattle

Dallas

Canada

All Foreign Countries

(Continued from page 211)		Southington Hdwe. Mfg. Co.,	205	Union Pacific Railroad	60
Respro Inc	21	Standard Tool Company	162	Van Dorn Iron Works Co., The	30
Richardson Company, The	6	Agency-THE DAVIS PRESS, INC.		Agency—Bayless-Kerr Company	30
Agency-THE JAY H. MAISH Co.		Steel Co. of Canada, Ltd., The	205	Vareum Chemical Corp	35
Rockford Machine Tool Co  Agency—Advertising Producers-Asso-	52	Sterling Bolt Company	205	Velepec, Fred M., Company	155
Rockford Screw Products Co	205	Stokes, F. J., Machine Co71 Agency—John Mather Lupton Co., Inc.		Vulcanized Rubber and Plastics	143
Rohm & Haas Company	157	Stricker-Brunhuber Corp Agency—Parker-Allston Assoc. Inc.	180	Agency-The Schuyler Hopper Co.	1.49
Agency-John Falkner Arndt & Co., Inc.		Stronghold Screw Products, Inc.	205	Wales-Beech Corp	205
Rohm & Haas Company, The Resinous Products Div	183	Swedlow Plastics Company Agency—H. C. Morris & Co., Inc.	39	War Assets Administration Agency—Fuller & Smith & Ross, Inc.	56
Inc.		Synthane Corporation 173, Agency—John Falkner Arnot & Co.,	174	Waterbury Companies, Inc Agency—Douglas Milne Associates	177
Royle, John & Sons	151	Inc.		Watertown Mfg. Co., The	181
Russell Burdsall & Ward Bolt & Nut Co	205	Taylor Fibre Company	177	Watlow Electric Mfg. Company Agency—Eggers-Rankin Adv. Service	168
Santay Corporation	32	Agency-Gray & Rogers		Watson-Stillman Company	15
Agency—The Vanden Company, Inc.	34	Tech-Art Plastics Company Agency-Knapp & Shepard, Inc.	22	Agency—O. S. Tyson & Co., Inc. Westchester Plastics Inc	45
Schulman, A., Inc	176	Tennessee Eastman Corp Agency—Kenyon & Eckhardt, Inc.	131	White, S. S., Dental Mfg. Co.,	
Schwartz Chemical Co., Inc	170	Thropp, Wm. R., & Sons Co	160	Agency—Peterson & Kempner, Inc.	158
Scovill Mfg. Company	205	Agency-Rickard Advertising Agency, Inc.	100	Witco Chemical Company Agency—HAZARD ADVERTISING Co.	169
Seaboard Screw Corp	205	Timken Roller Bearing Co., The	44	Wood, R. D., Company	172
Shakeproof, Inc	205	Tinnerman Products, Inc	11	Agency-Harris D. McKinney	205
Shell Oil Company Inc	26	Agency—Meldrum and Fewsmith, Inc.  Titanium Pigment Corp	14	Wolverine Bolt Company Worcester Moulded Plastics Co	205 214
Sillcocks-Miller Co., The	159	Agency-Doyle, Kitchen & McCormick, Inc.	~ ~	Agency-C. JERRY SPAULDING, INC.	
Sinko Mfg. & Tool Company	147	Tupper Corporation	70	Yardley Plastics Company Agency—Byer & Bowman, Inc.	61

## polish the automatic way MODERN METHODS SAVE UP TO 85%

You can usually save more than half the cost of your plastic finishing operations by changing to high speed Lupomatic Tumbling Barrels and efficient Tumbling Procedure. In addition, the purchase of a Lupomatic finishing installation entitles you to the advice and guidance of our finishing experts.

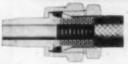
Send a sample piece for a free demonstration and recommendations on how you can save time and factory space and how you can improve the ap-

pearance of your product. Regardless of its size or shape, we will chart a procedure which will cut your costs. Write today.

EUPO RESEARCH LABORATORIES
9 NORTH WEST STREET, MOUNT VERNON, N. Y.
Mount Vernon 7-2423







Packless Detachable Coupling; strong, compact, reusable, requires no heat to apply. A leak-proof, metal to metal connection.

Packless Flex-Control Unit; selfdraining at all times. An efficient, horizontal self-supporting flexible hose unit specially designed for platen presses.

Packless Seamless Flexible Bronze Hose; made from highest grade, straight-drawn, annealed tubing and fabricated to give long, dependable service. Wide variety for all applications in plastic industry.



Packless Units are so well regarded that they are invariably specified by leading equipment manufacturers and operating men throughout the industry.

**PACKLESS** 

METAL PRODUCTS CORP.

NEW ROCHELLE NEW YORK



# a Good Deal in CUSTOM INJECTION MOULDING

Customers who bring their plastic problems to Worcester Moulded are always certain of a "good deal," plastically speaking. Because we are the largest custom injection moulders in the East, you too will find a complete plastic service right at your fingertips. Our die designers, die makers, moulders, finishers and inspectors concentrate on the successful manufacture of customers' products with volume, quality production to dovetail with customers' needs. Since we neither manufacture nor market any product of our own, you can consider us the plastics department of your plant. If you are interested in the redesigning of a product or the application of plastics to a new one, we will welcome your most detailed questions.





#### WORCESTER MOULDED PLASTICS CO.

14 HYGEIA STREET, WORCESTER 8, MASS.

17 East 42nd St., New York 17, N. Y. 130 West Chippewa St., Buffalo 2, N. Y.

# PICTURE OF AN IDEAWORKING!





Here is a picture of a good idea at work. It shows the injection-molding of brush backs from BAKELITE Styrene Plastics by Empire Brush Works, Inc. Proof-positive that the correct manufacturing technique applied to the right plastic assures three-way satisfaction: — manufacturers achieve lower costs, merchants profit from faster turn-over, consumers feel that they get their money's worth!

You, too, may have a product that can benefit through the use of Bakelite Styrene Plastics... plastics which offer many advantages. They can be molded on standard equipment to complicated shapes and superfine detail. They are dimensionally stable, mechanically strong, light in weight, and resistant to water, caustics, even to strong acids.

They come in all colors, either transparent, translucent, or opaque, and in water-clear crystal. They can be inexpensively molded into attractive, serviceable packages, closures, toys, displays, and many other articles.

If you have new products on the design board, now is the time to submit sketches and blueprints to Bakelite Corporation's engineering staff for careful, confidential evaluation. By doing so you may well save valuable time and money and improve the position of *your* products in today's competitive market. Write to Department 11.



#### Have you a steak in plastics?

♦ Here's a case where plastics contribute to good eating—by forming an attractive, resistant, easy-to-clean housing for this new cube steak machine. It was engineered and molded by General Electric for the Cube Steak Machine Company, Inc., of Boston, Massachusetts. The gleaming white plastics surface resists the action of meat juices and cleaning agents—stays lustrous and beautiful despite the wear and tear of everyday use.

Are you taking full advantage of plastics? Whether you make steak machines, lipsticks, or locomotives, General Electric's *complete* plastics service is equipped to design, engineer, and mold plastics to meet your individual requirements. The world's largest molder of finished plastics products, G. E. works with all types of plastics materials—can recommend without bias the best one for your particular job.

May we send you, free, the full-color booklet, "Problems and Solutions in Plastics"? Just write Plastics Division, Chemical Department, General Electric Co., I Plastics Avenue, Pittsfield, Mass. BACKED BY 53 YEARS OF EXPERIENCE. We've been designing and manufacturing plastics products ever since 1894. G-E research works continually to develop new materials, new processes, new applications.

NO. I PLASTICS AVENUE—complete plastics service—engineering, design and mold-making. Our own industrial designers and engineers, working together, create plastics parts that are both scientifically sound and good-looking. Our own toolrooms are manned by skilled craftsmen—average precision mold experience, 12 years.

ALL TYPES OF PLASTICS. Facilities for compression, injection, transfer and cold molding ... for high and low pressure laminating ... for fabricating. G-E Quality Control—a byword in industry, means as many as 160 inspections and analyses for a single plastic part.



GENERAL ELECTRIC PLASTICS FACTORIES ARE LOCATED IN DECATUR, ill., COSHOCTON, OHIO,
MERIDEN, CONN., SCRANTON, PA., TAUNTON AND PITTSFIELD, MASS.

